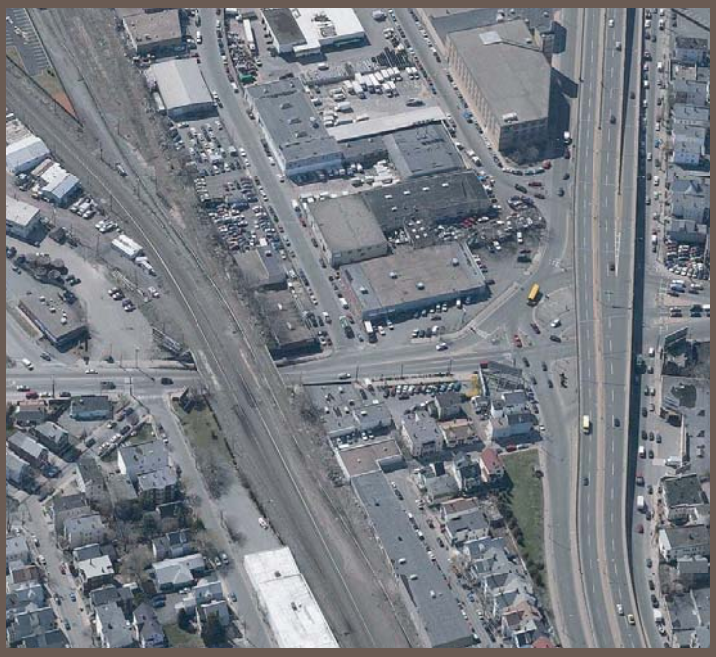

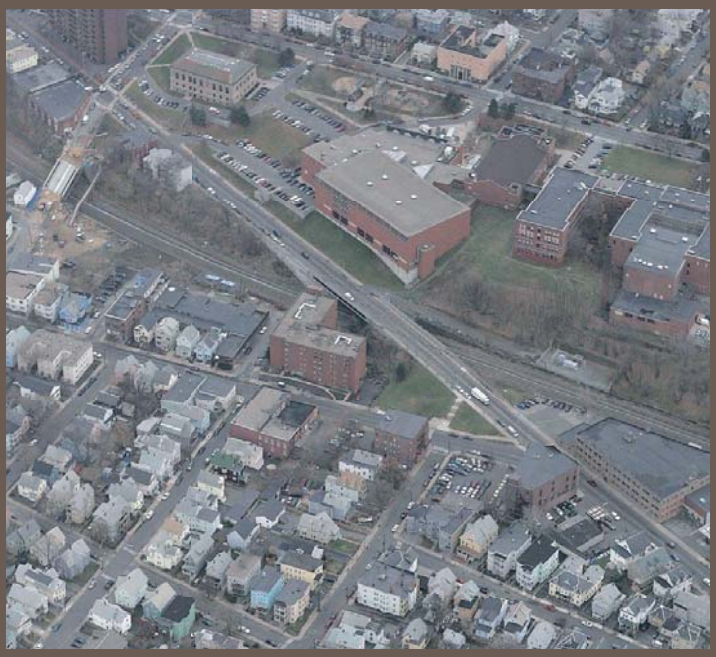

Somerville Community Path Feasibility Study

School Street to Cambridge Line

Prepared for:

City of Somerville, Massachusetts
Strategic Planning and Community Development

July 14, 2006

Prepared by:

VOLLMER

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Appendices

section 1

Study Summary

1.0 Study Summary

This project examines the feasibility of constructing a proposed section of the Somerville Community Path along the Southern New Hampshire Main Line. This corridor currently serves active rail traffic that includes the MBTA Lowell Commuter Rail and Guilford freight operations. This study focuses on an extension of the existing Community Path running along the ROW from School Street to the Somerville/Cambridge line. Ultimately, this path is envisioned extending north from School Street to Central Street where the path departs the active ROW and connects with sections of the path that are either built or in the final stages of design. A future section of the proposed trail from School Street to Central Street is not included in this study (due to study funding limits) but is assumed to be along the western edge of the corridor at the top of the embankment.

In the past, MBTA policy has been unfavorable to the construction of trails within or directly adjacent to active rail corridors (so called "rails-with-trails"). Recently however, the MBTA has shown a greater willingness to consider path construction where clear separation of pedestrian and rail is demonstrated. A relevant example is the proposed Cedar Street to Central Street segment of the Somerville Community Path, where grade separation of the path from the active right-of-way within the right-of-way is moving forward.

While the initial premise was to construct the entire Community Path (form School Street to the Cambridge line) upon the right-of-way embankment, further analysis has shown that this is not entirely feasible. Therefore, in certain locations, the concepts consider alignments within portions of the active rail corridor. Where sections of the proposed path are conceptually shown to push within the active rail bed area, the final design should anticipate that the path would be elevated a minimum of 3'-4' in height above the track grade and should be provided with secure fencing or railing acceptable to the MBTA. This grade separation is intended to improve the safety of pedestrians as well as the quality and character of the path, without interference to rail operations.

This study builds on the 2001 report, prepared by Rizzo Associates, that recommended an entirely off-road path using embankments along the corridor and relocation of an existing freight track.

1.1 Overview of the Green Line Extension Project

The Green Line extension is one of several mitigation projects proposed by the State as part of the Big Dig environmental process. In 2004, the MBTA hired a planning team to study the feasibility of extending the Green Line from Cambridge into Somerville and Medford (See Appendix B for typical sections). This study indicates that this extension provides a number of benefits for the costs. Subsequently, in May of 2005, the State announced their intent to move forward with the project. This study finds that the Green Line extension Project provides a number of advantages that should facilitate development of the Community Path, and that the path provides benefits to the extension project as well.

1.2 Alternatives

In light of MBTA policies related to trails near active Right-of-ways and the future Green Line, this study focused on three alternatives:

- Alternative 1: A trail utilizing embankments and inactive rail sections beyond Washington Street that avoids the development of any elaborate structures.
- Alternative 2: A trail utilizing embankments and inactive rail sections beyond Washington Street including a structure to bridge the gap between Cross Street and Washington Street.
- Alternative 3: A trail utilizing embankments and some portions of the active ROW after McGrath Highway (as proposed by Rizzo Associates).

Based on an examination of the constraints, construction issues, estimated costs, and pending projects, the third alternative was further advanced and is provided in this study as the Recommended Plan.

- The proposed Green Line Project is moving forward and is slated to be built to the western side of the rail corridor. The westerly side is also the preferred location of the Community Path. Construction of the path adjacent to the light rail service is preferred over location next to the heavy rail operations.
- Extension of the Green Line will require relocation/removal of the freight track from Lowell Street to Washington Street. The onus of relocating the freight track is removed from the community path project.

1.3 Study Conclusions & Recommendations

The Recommended Plan is provided in Chapter 6 of this study. Based on input from the City, advocate groups, and the MBTA; a number of conclusions can be drawn from this study. These include the following:

- According to the MBTA study, the bridges at Medford Street and School Street are substandard in width (to accommodate the Green Line) and will need to be rebuilt. Reconstruction of the Medford Street Bridge provides opportunity to run the path beneath Medford Street, thereby improving path alignment and avoiding crossing Medford Street where the vertical crest of the bridge makes sight lines poor.
- MBTA stations are under consideration at City Hall/Gilman Square and at Washington Street. These stations are slated for important points of arrival and destination that compliment the path.
- The rail bridge over the Fitchburg Line (former Red Bridge) has been removed. Installation of a new pedestrian structure will need to consider the MBTA's plan to elevate the Fitchburg Line to alleviate flooding issues. Further consideration of a possible Union Square extension of the Green Line will also need to be considered.
- Location of a new Light Rail storage yard is being considered at the Yard 8 location.

- The rail yard operations south of the Fitchburg Line will be replaced by the North Point development. The North Point Development includes plans for a path that extends to the Charles River.
- The new Lechmere Station is an elevated station with tail tracks leading north out of the station. Extending this elevated structure north over the Fitchburg Line would allow the potential for the path to cross (west to east) under the Green Line to the North Point connection. This structure would also allow the development of a new connection into the Southern Inner Belt district, something recently explored by the City of Somerville.
- Construction of the path in conjunction with the Green Line improves construction access to the corridor and thereby feasibility of path construction.
- Creation of the path in conjunction with the Green Line extension provides greater access to the proposed MBTA stations.
- Location of the MBTA station at City Hall/Gilman Square may require relocation of the electrical sub-station. Final location should be based on costs of relocation and the need for maintenance access. The path is viewed as a means of both maintenance and emergency access to both the electrical sub-station as well as the MBTA station.
- The highest and best use of the embankment at Chester Street is for ramped connections to/from the McGrath Highway and Cross Street.
- Location of the Washington Street station (as shown on the Recommended Plan) on the south side of the bridge provides greater room for the station with fewer impacts to adjacent residences. This location also provides potential access to buses from Joy Street. This location will require some property taking.
- Location of the path along the westerly edge of Yard 8 should consider the active freight track as well as potential staging of Green Line cars.
- A path connection from the north side of Washington Street (behind Cataldo Ambulance) allows pedestrian access via the path to the proposed MBTA station, thereby alleviating the need to cross Washington Street at-grade.

section 2

Study Introduction

2.0 Study Introduction

2.1 Study Understanding

In May of 2001, the City of Somerville developed a feasibility study linking the existing linear park at Davis Square to Lechmere. The purpose of the study was to develop a continuous bicycle-pedestrian connection. The 2001 feasibility study, which forms the basis for this project, looked at three optional path routes, the first two as initial concepts, and the third as the recommended alternative. Whereas the first study identified the preferred route, this effort will be geared towards developing solutions to the complexities of the paths vertical and horizontal alignment. In particular, this study will address the pathway's horizontal spatial requirements and constraints, the vertical rise and run of the paths, and the safety and feasibility of street crossings and bridge underpasses. Several key factors that must be considered include the proposed Green Line extension, the MBTA Lowell commuter rail line, and the Guilford railroad freight line.

Figure 2.1 Bike Paths

2.2 Study Location

The proposed Somerville Community Path as currently envisioned stretches from Davis Square to Lechmere as shown in figure 2.1. Portions of the path from Davis Square to Cedar Street were constructed in 1992. The section of path from Cedar Street to Central Street is in the final stage of design as of this study.

This report analyzes the feasibility of constructing a path adjacent to the New Hampshire Main Line from School Street to the Cambridge line. The total length of the path measures approximately 7000 feet (1.3 miles).

2.3 Major Crossings

Along the proposed path route, there are seven major crossings that are required. These are listed in figure 2.2.

#	Crossing	Width	Crossing Type
1	School Street	46’	1-lane roadway w/ parallel parking
2	Medford Street	136’	2-lane roadway w/ parallel parking
3	Walnut Street	48’	1-lane roadway w/ parallel parking
4	McGrath Highway	150’	6-lane roadway
5	Cross Street	58’	2-lane roadway
6	Washington Street	78’	6-track bridge over 2-lane road
7	Fitchburg Line	130’	former Red Bridge (removed)

Figure 2.2 Major Crossings

2.4 Pathway Segments

Along the rail line, the project can be broken into seven distinct segments. Each segment's beginning and end is distinguished by a street crossing, a rail crossing, or a future trail link. This is illustrated in figure 2.3.

Figure 2.3

Project Corridor

Somerville Community Path:
School Street to Cambridge Line

4 Project Segments

Community Path Extension

Future Green Line Extension (Existing Freight Line)

Commuter Rail

Major Crossing

NORTH

Prepared by:

VOLLMER ASSOCIATES LLP

section 3

Previous Studies and Reports

3.0 Previous Reports and Studies

The following is a summation of related reports and studies that have been reviewed as part of this study.

3.1 Somerville Community Path Feasibility Study

In May 2001 Rizzo Associates in association with ICON Architecture prepared a report exploring the feasibility of constructing a bicycle/pedestrian facility linking the existing linear park at Davis Square to Lechmere. This report included project background, conceptual alternatives analysis, and a recommended alternative (see figure 3.1). This recommended alternative included eight segments detailed in figure 3.2.

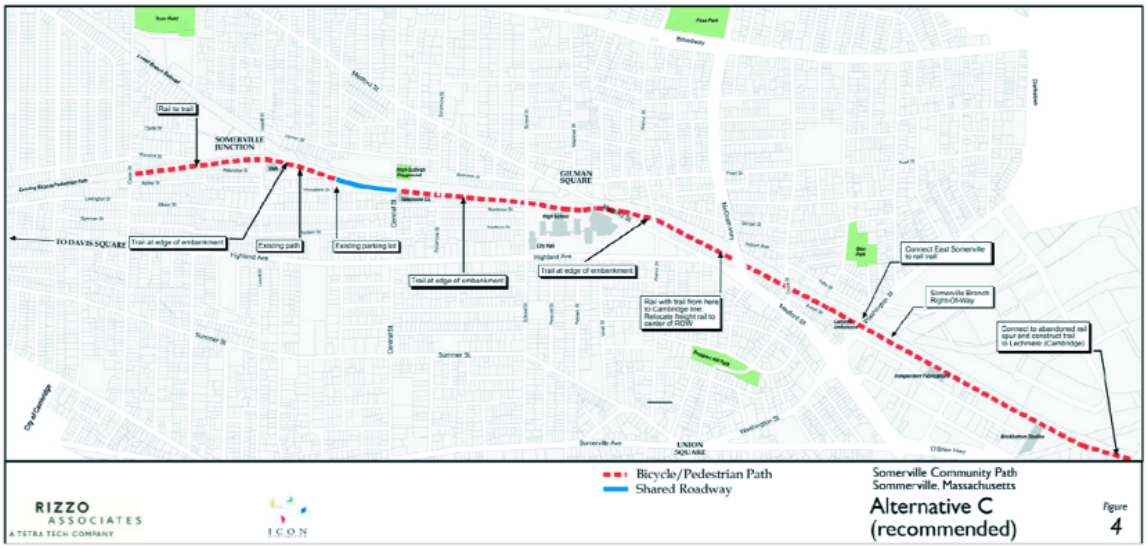


Figure 3.1 Recommended Alternative

#	Segment	Project Type
1	Cedar Street to Lowell Street Via Lexington Branch Freight Cut-off	Bike path (rail-to-trail)
2	Lowell Street to Visiting Nurses Association (VNA)	Ramp up with high retaining wall
3	VNA to Central Street	Path along Cambridge Health Alliance land
4	Central Street to Walnut Street	Path at top of west ROW embankment
5	Approach to McGrath Highway	Ramp down with high retaining wall
6	McGrath Highway to Washington Street	Path at west edge of ROW at/near railroad grade
7	Washington Street to Lechmere via spur track	Path at west edge of ROW at/near railroad grade
8	Lechmere Spur (Cambridge)	Bike path (rail-to-trail)

Figure 3.2 Recommended Segments

3.2 North Point Somerville Planning Study

In February 2003 ICON Architecture in association with FXM Associates and Bruce Campbell and Associates/Beta Group, Inc. prepared a planning study that examined the potential opportunities and impacts of Cambridge rezoning and the North Point Development on the adjacent areas of Somerville. Namely, these included the Inner Belt District and the McGrath Highway Corridor. This study also explored a future vision for the area beyond North Point that included incorporation of the Green Line and the Community Path in the Innerbelt District.

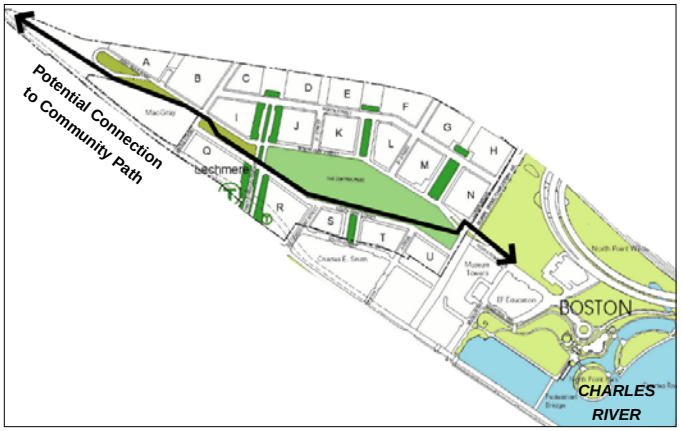


Figure 3.3 North Point Development

3.3 North Point Development Proposal

Located in Cambridge, Somerville, and Boston, the North Point project involves the redevelopment of 48-acres of industrial sites and former rail yards. The proponent, the North Point Land Company, filed and Environmental Notification Form on November 15, 2001; and the Secretary of Environmental Affairs issued a Certificate on June 21, 2002. The project will result in a mixed-use, transit-oriented neighborhood with over 10 acres of new green space and a variety of new utilities and roadway infrastructure improvements. North Point is located at the convergence of the Somerville Community Path, the Dr. Paul Dudley White Bicycle Path, the MBTA Green Line, and the future DCR Charles River Basin Park. Walking and bicycling will be encouraged through enhanced pedestrian connections along key corridors and through the implementation of bicycle lanes and supporting amenities. A north-south link between the Somerville Community Path and the Charles River Basin Park is included in the development.

The North Point development also anticipates the MBTA's extension of the Green Line beyond Lechmere to Somerville and Medford. The Green Line alignment through the North Point area follows the railroad easement along the southern border of the site. The proposed Green Line will connect to the New Hampshire Main Line at a point just south of the former Red Bridge. Within the site, the new MBTA Lechmere and tail track storage area will be elevated.

3.4 Somerville Community Path: Cedar to Central

Vollmer Associates LLP is working on the final design plans for the Community Path from Cedar Street to Central Street. This section of the path is comprised of 2,800 linear feet of path that 1) utilizes a section of the Lexington Branch Freight Cut-off, 2) a portion of the New Hampshire Mainline ROW, and 3) private property. When complete, this extension will bring the path to grade with Central Street.

3.5 Inner Belt Park Access Alternatives Study

In March of 2003 the City of Somerville retained Vollmer Associates LLP to prepare an access study investigating the potential for new or improved points of access to the Inner Belt Park area. This document was completed in April of 2005.

The purpose of this study was to develop conceptual alternatives that provide improved access to the southern half of the Inner Belt District. Although located in close proximity to Interstate 93 and several major urban arterials, this district suffers from poor vehicular and pedestrian access. These concepts were geared towards access improvements that are not dependent on major development or zoning changes, and that minimize impacts to existing railroad operations.

Several concepts from this study cross the Community Path corridor from McGrath Highway into the Inner Belt District. One alternate is shown in figure 3.4.

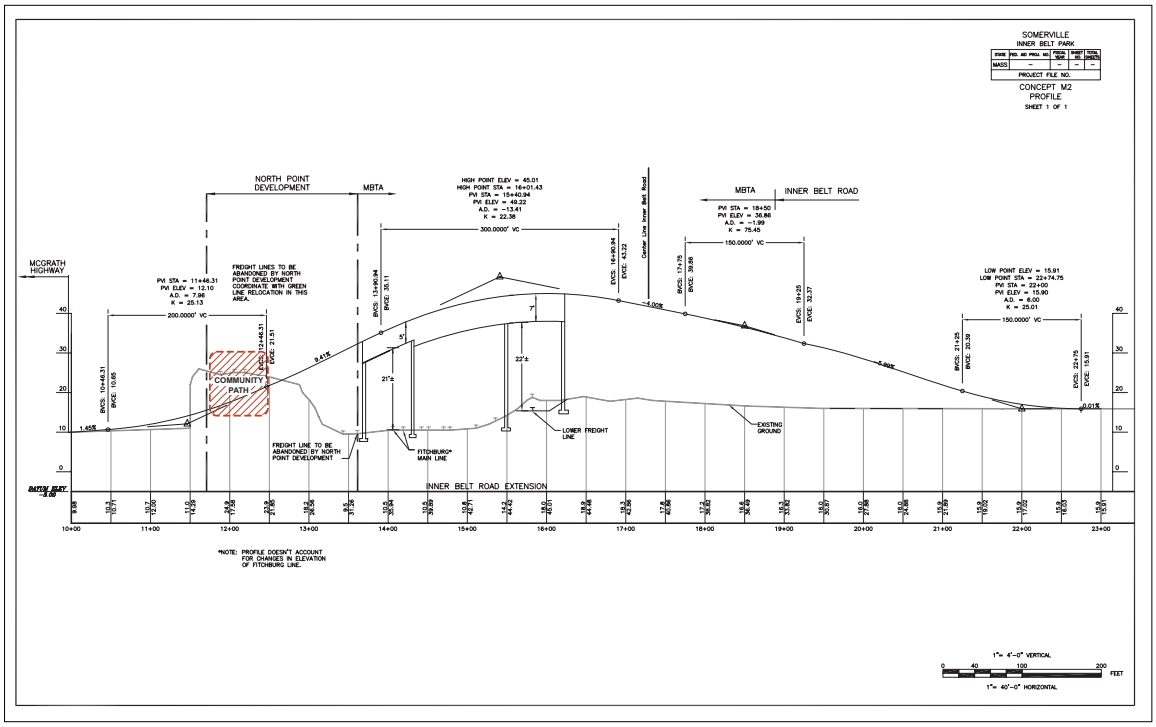


Figure 3.4 Conceptual Alternative M2 Alignment

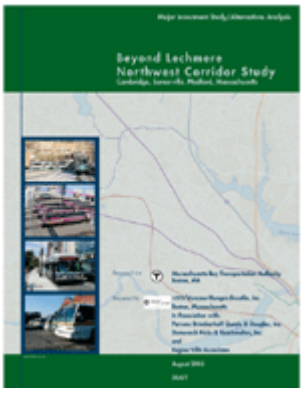


Figure 3.5 Green Line Ext.

3.6 Green Line Extension: Beyond Lechmere - Northwest Corridor Study

In 2004, the MBTA hired the team of Parsons Brinckerhoff and VHB to study the feasibility of extending the MBTA Green Line from Lechmere station to Medford. This study is focused on using the New Hampshire Main Line corridor for light rail (Green Line), BRT's (Bus Rapid Transit), or additional Commuter rail stations on the Lowell Line. On May 18, 2005, State transportation officials announced they plan to move forward with the Green Line extension.

3.7 Cross Street Bridge

MassHighway is currently working on the design of a bridge to replace the existing Cross Street bridge. Proposed connections to the Somerville Community Path should be coordinated with this effort.

section 4

Existing Conditions, Issues, and Options

4.0 Existing Conditions, Issues, and Options

This section analyzes each segment of the corridor on a street to street basis. Each segment is discussed in terms of the existing conditions, the major constraints and opportunities, and the options for implementing the path. Refer to figure 4.0 for a map of the study corridor.

Figure 4.1 School St. bridge

Figure 4.2 Western bridge abutment at School St.

Figure 4.3 View north towards School St. abutment

4.1 School Street

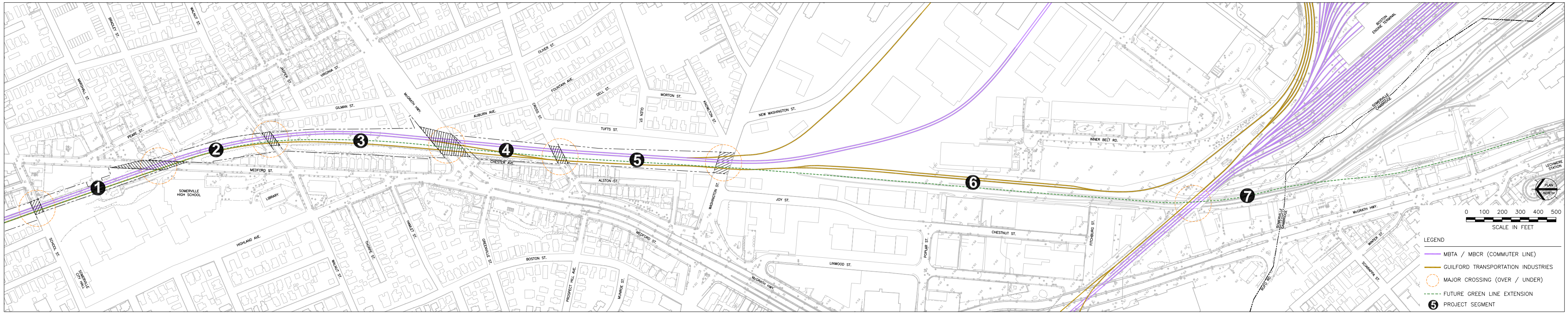
Existing Conditions: School Street crosses over the New Hampshire Main Line via a concrete beam structure that was constructed in 2001. The street is approximately 32' wide with a 6' wide sidewalk on either side. Each side of the bridge is protected by a concrete parapet wall and anti-missile fencing. Wood post and steel w-beam guard rail are located on either approach to the bridge.

The distance between the bridge abutments, measured perpendicular to the tracks, is approximately 75' with 3 tracks passing beneath the bridge.

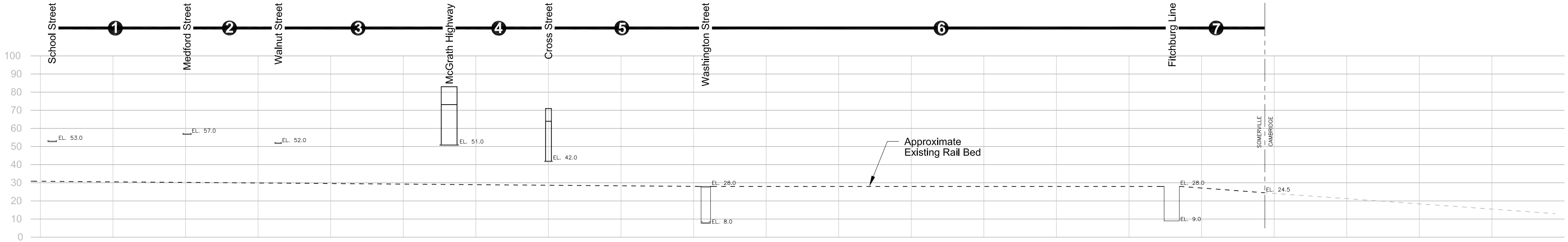
Constraints: School Street is a one-way street that runs at a gradient of approximately 9% up past City Hall to Highland Avenue. The street is narrow and congested by parallel parking on either side of the street. Crossing at the proposed location presents several issues including limited sight lines and visibility of path users, access through the bridge abutments, and the need for transition ramps at the street curbs.

Opportunities: There appears to be sufficient space at the end of each bridge abutment to remove the guard rail and connect the path at-grade to the street on either side. Removal of the guard rail, at this point, should not present a hazard since traffic flow is up the hill. A new terminal end on the guard rail will be required on either side of the street.

Options: For the purposes of this study, the School Street crossing is assumed to be at-grade. The path would cross south of the rail corridor, requiring breaks in the curb and guard rail. Consider the use of a raised crosswalk to slow traffic to make this crossing safer.



PLAN
Horizontal Scale: 1" = 400'-0"



PROFILE
Horizontal Scale = 1" = 400'-0"
Vertical Scale: 1" = 40'-0"

VOLLMER ASSOCIATES LLP

Somerville Community Path Feasibility Study
School Street to Cambridge Line

FIGURE 4.0 - EXISTING CONDITIONS

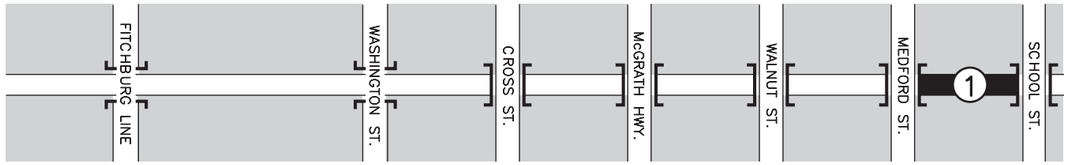


Figure 4.4 View looking south toward Segment 1

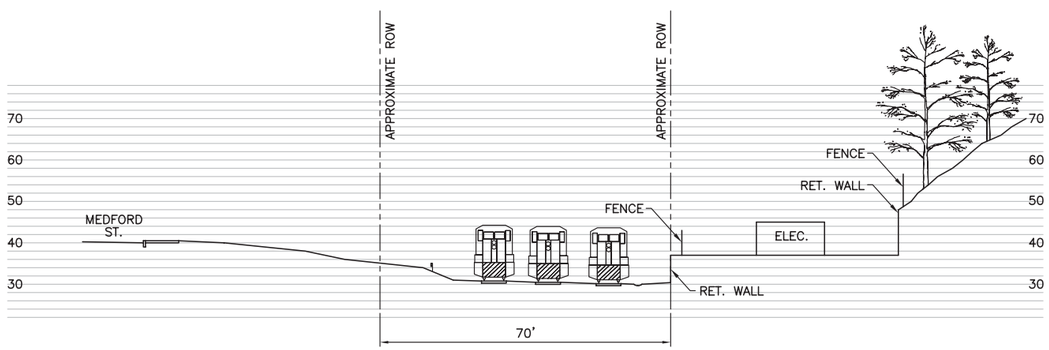


Figure 4.5 Typical cross section at Segment 1

Figure 4.6 Narrow right-of-way near School St.

Figure 4.7 Electrical substation near Medford St.

Figure 4.8 Looking south towards Medford St.

Figure 4.9 Elec. substation access to Medford St.

4.2 School Street to Medford Street - Segment 1

Existing Conditions: Traveling south along the New Hampshire Main Line, the distance from School Street to Medford Street is approximately 700 linear feet. The vertical elevation of School Street is approximately El. 53.0. The vertical elevation of Medford Street is approximately El. 57.0.

Located adjacent to the railroad corridor is an electrical substation with a fenced enclosure and a narrow access drive up to Medford Street. This substation occupies the site of a former train stop and is situated at El. 37.5. A 9' height granite wall supports the adjacent hillside. The adjacent hillside is steep (1:1) and wooded with a crib wall and cast-in-place wall situated along the slope just below the high school. The access drive from the electrical substation up to Medford Street runs at a gradient of approximately 7%. The north side of the Medford Street bridge is supported by a sloping retaining wall.

Abutting Land Use: The adjacent land use includes city hall and the high school.

Constraints: The right-of-way throughout this segment is very narrow, containing 3 tracks and averaging only 79' in width. In the vicinity of the electrical substation, the right-of-way measures approximately 52' in width. There is not enough space to construct a path between the freight line and the electrical substation. The hillside adjacent to the tracks is very steep, making the construction of a path difficult. Typically, a wall will be required on the downhill side.

Opportunities: As part of the proposed Green Line extension, there has been consideration to construct a "T" station at this location to serve the Somerville High School, City Hall, and the surrounding neighborhoods. If a "T" station is built in this area, there may be an opportunity to link the community path to the station.

With grading changes, there is sufficient space to construct a path along the slope, behind the High School, on land which is currently owned by the City. The access drive to the electrical substation could provide an existing curb cut and potentially be used for the path.

Options: 1) Construct a path along the top of the slope, 2) ramp down to the electrical substation, then back up to Medford Street, or 3) ramp down to the electrical substation, then begin to tunnel beneath Medford Street.

Figure 4.10 Medford St. towards Walnut St.

Figure 4.11 Medford St. towards Walnut St.

Figure 4.12 Elec. Substation access from Medford St.

4.3 Medford Street

Existing Conditions: Medford Street crosses over the New Hampshire Main Line at a skewed alignment via a concrete beam structure that was constructed in 1910 and later rebuilt in 1983. The street is approximately 32' wide with a 5' sidewalk on either side. Each side of the bridge is protected by a concrete parapet wall with chain link fencing.

The distance between the bridge abutments, measured perpendicular to the tracks, is approximately 58' with 3 tracks passing beneath the bridge.

Constraints: Medford Street is a two-way street that runs at a gradient of approximately 6.5% up to the bridge and continues at a gradient of approximately 2.5% up to Walnut Street. Crossing at the proposed location presents several issues including limited sight lines and visibility of path users and the need for transition ramps at the street curbs. The street has parallel parking on one side of the street.

Opportunities: With the possibility of the Green Line extension, there may be a need to widen the Medford Street bridge to accommodate 4 tracks (2 for the commuter rail and 2 for the Green Line). This reconstruction could potentially accommodate the path as well.

The configuration of the existing parapets could be modified to allow for a path crossing at-grade.

Options: 1) Cross Medford Street at-grade, or 2) modify the bridge to accommodate a path under the street.

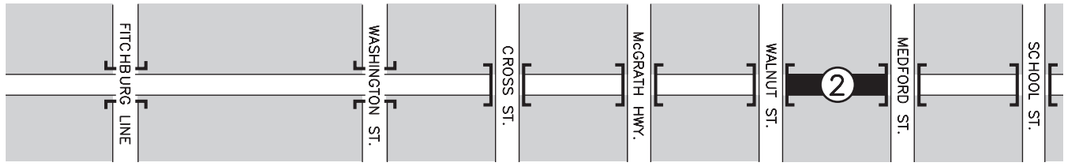


Figure 4.13 View looking south toward Segment 2

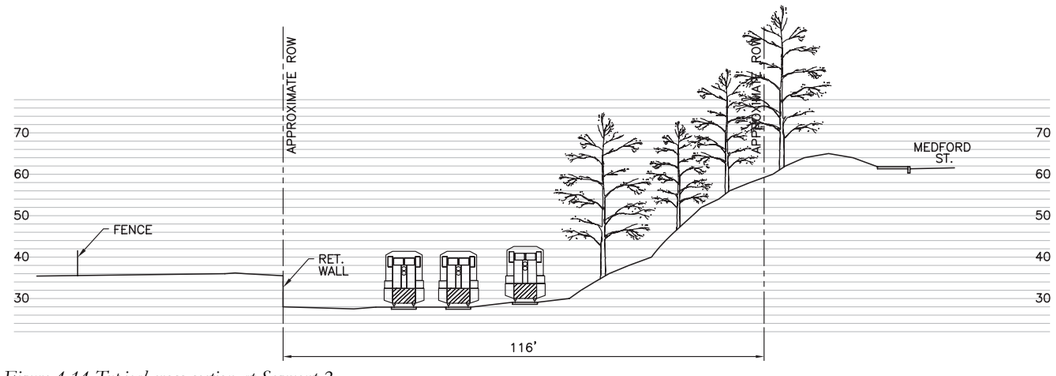


Figure 4.14 Typical cross section at Segment 2

Figure 4.15 Looking north towards Medford St.

Figure 4.16 Embankment near Medford St.

4.4 Medford Street to Walnut Street - Segment 2

Existing Conditions: Traveling south along the New Hampshire Main Line, the distance from Medford Street to Walnut Street is approximately 465 linear feet. The vertical elevation of Medford Street is approximately El. 57.0. The vertical elevation of Walnut Street is approximately El. 52.0.

Abutting Land Use: The adjacent land use is primarily multi-family residential.

Constraints: The hillside adjacent to the rail bed is steep (2:1) and wooded. There is not enough space to construct a path between the freight line and this slope. Construction access will be limited throughout this segment.

Opportunities: Although the right-of-way throughout this segment averages 103' in width, the rail bed only averages 65' in width. The adjacent hillside provides a significant amount of right-of-way for the path.

Options: 1) Construct a path along the top of the slope, or 2) construct a path at the base of the western slope, or 3) ramp up the western edge of the slope.

Figure 4.17 Walnut St. bridge

Figure 4.18 Northwest approach at Walnut St.

4.5 Walnut Street

Existing Conditions: Walnut Street crosses over the New Hampshire Main Line via a concrete beam structure that was recently constructed in 2003. The street is approximately 24' wide with a 4' sidewalk on either side. Each side of the bridge is protected by a concrete parapet wall with anti-missile fencing. Wood post and steel w-beam guard rail are located on either approach to the bridge. The vertical elevation at the western end of the bridge is approximately El. 52.0.

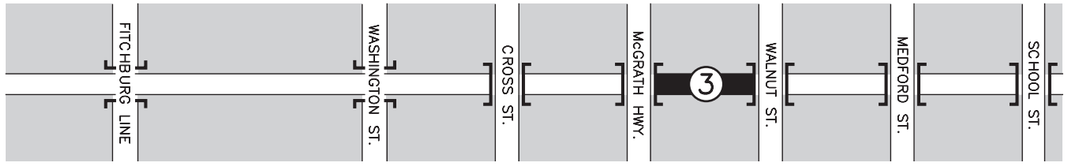
The distance between the bridge abutments, measured perpendicular to the tracks, is approximately 66' with 3 tracks passing beneath the bridge.

Constraints: Walnut Street is a one-way street that runs at a gradient of approximately 12% down from Medford Street. Limited sight lines and visibility of path users will be issues when crossing the street at-grade. The street is narrow and congested by parallel parking on either side of the street.

Removal of the guard rail exposes the end post, presenting a safety hazard, and will need to consider the downhill traffic flow.

Opportunities: There appears to be sufficient space at the end of the bridge abutment to remove the guard rail and connect the path at-grade to the street on either side.

Options: 1) Cross Walnut Street at-grade, or 2) modify the bridge to accommodate a path under the street. Consider the use of a raised crosswalk to slow traffic to make this crossing safer.



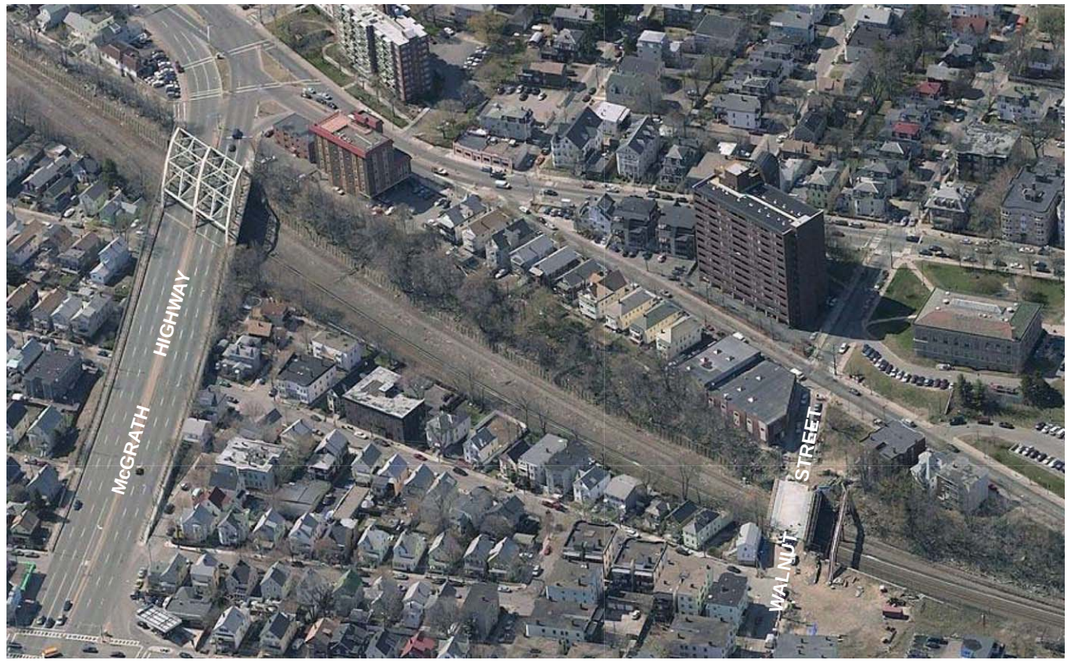


Figure 4.19 View looking south toward Segment 3

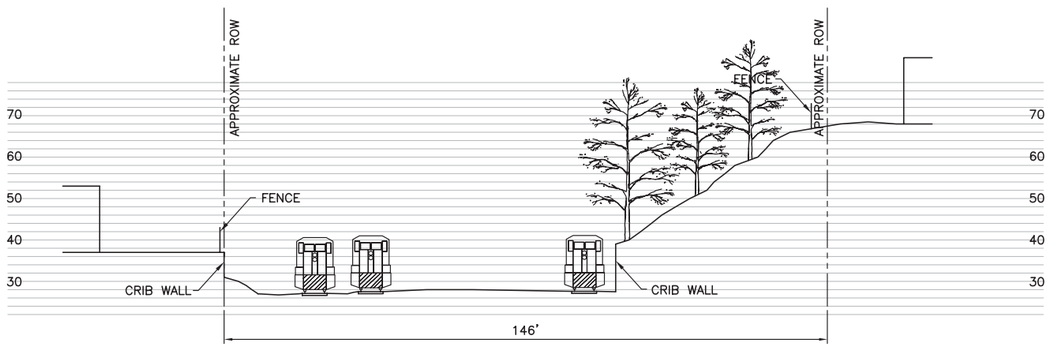


Figure 4.20 Typical cross section at Segment 3

Figure 4.21 Looking south from Walnut St.

Figure 4.22 Between Walnut St. and McGrath Hwy.

Figure 4.23 Looking south towards McGrath Hwy.

4.6 Walnut Street to McGrath Highway - Segment 3

Existing Conditions: Traveling south along the New Hampshire Main Line, the distance from Walnut Street to the McGrath Highway is approximately 875 linear feet. Although the right-of-way throughout this segment averages 135' in width, the rail bed ranges from 80' to 120' in width and accommodates 3 tracks. The vertical elevation of Walnut Street is approximately El. 52.0. The vertical elevation of the McGrath Highway is approximately El. 51.0.

Abutting Land Use: The adjacent land use includes a service garage, mutil-family homes, and apartment buildings.

Constraints: The side slope immediately adjacent to Walnut Street is extremely steep (1:1) and wooded with a crib wall at the edge of the tracks. There is not enough space to construct a path between the freight line and the crib wall.

Opportunities: The slope adjacent to the tracks varies in width from 30' to 52'. The freight track appears to be out of service.

Options: 1)Construct a path along the top of the slope, 2) ramp down to the western edge of the rail bed, or 3) use the rail bed to construct a path.

Figure 4.24 Looking north towards McGrath Hwy.

4.7 McGrath Highway

Existing Conditions: The McGrath Highway crosses over the New Hampshire Main Line via a steel truss structure that was constructed in 1908 and later rehabilitated in 1983. The street is approximately 85' wide with a 9' cantilevered sidewalk on either side (outside of the trusses). An existing signalized intersection crosswalk is located just to the east of the bridge at the intersection of McGrath Highway and Medford Street.

Constraints: The McGrath Highway is a two-way arterial, with three lanes in each direction, running at a gradient of approximately 3% up toward Medford Street. The bridge structure creates an impediment to crossing the bridge at-grade. Traffic volumes along the McGrath Highway require a signalized crossing.

Opportunities: The distance between the bridge abutments, measured perpendicular to the tracks, is approximately 117' with 3 tracks passing beneath the bridge. There is ample right-of-way under the bridge including a low clearance area (approximately 8' height) near the abutment.

Options: 1) Utilize the nearby signalized crosswalk, 2) utilize the "shelf" below the bridge, or 3) use the rail bed to construct a path.

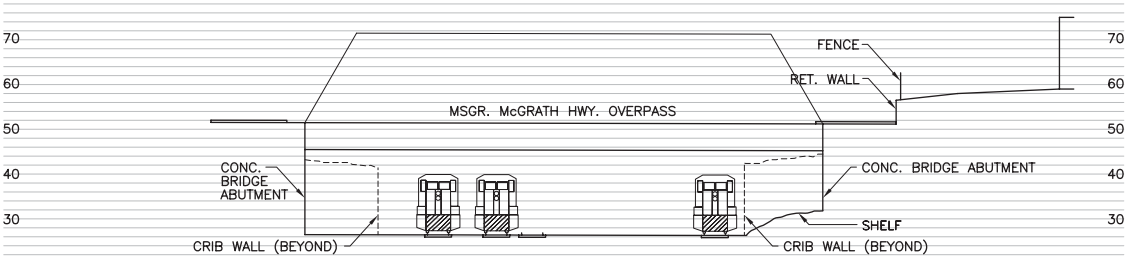


Figure 4.25 Cross section at McGrath Highway overpass

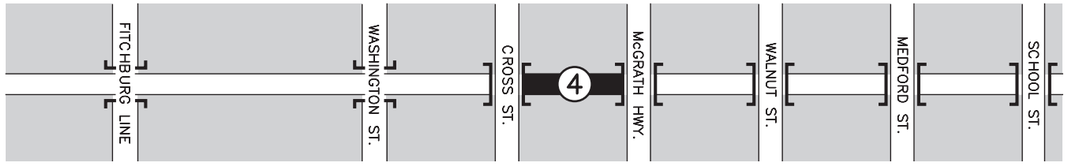


Figure 4.26 View looking south toward Segment 4

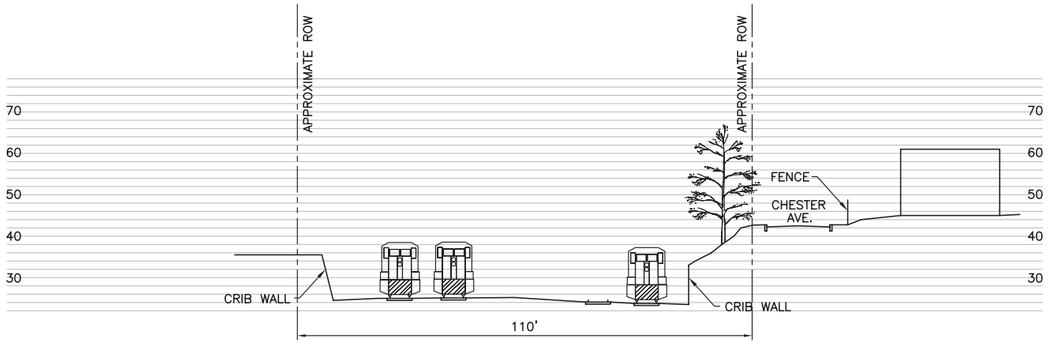


Figure 4.27 Typical cross section at Segment 4

Figure 4.28 Looking north on Chester Ave.

Figure 4.29 Embankment along Chester Ave.

Figure 4.30 Looking south on Chester Ave.

4.8 McGrath Highway to Cross Street - Segment 4

Existing Conditions: Traveling south along the New Hampshire Main Line, the distance from the McGrath Highway to Cross Street is approximately 475 linear feet. The vertical elevation of the McGrath Highway is approximately El. 51.0. The vertical elevation of Cross Street is approximately El. 42.0.

Abutting Land Use: The adjacent land use includes auto sales/service, and residential.

Constraints: The adjacent hillside is steep (1:1) and lightly wooded with a crib wall at the edge of the tracks. There is not enough space to construct a path between the freight line and the crib wall.

Opportunities: There is a shoulder, ranging from 6' to 18' in width, adjacent to Chester Avenue that could potentially be used for a path.

The right-of-way averages 110' in width and contains only 3 tracks, providing ample room for a path along the rail bed.

Options: 1) Construct a path along the top of the slope adjacent to Chester Avenue, 2) construct a path in the rail bed, or 3) use the slope for access to the path.

Figure 4.31 Looking east on Cross St.

Figure 4.32 Sidewalk along Cross St. bridge

Figure 4.33 Looking north towards Cross St.

Figure 4.34 Western bridge abutment at Cross St.

4.9 Cross Street

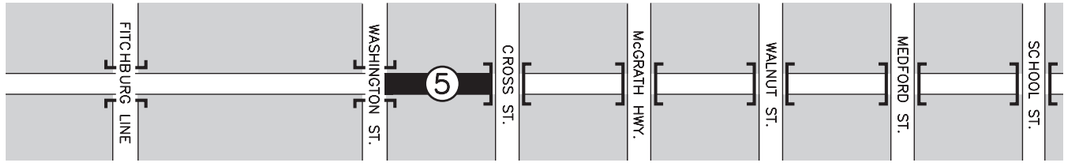
Existing Conditions: Cross Street passes over the New Hampshire Main Line via a steel truss structure that was constructed in 1928. The street is approximately 30' wide with a 6' cantilevered sidewalk on either side (outside of the trusses). The surrounding neighborhood is largely residential.

The distance between the bridge abutments, measured perpendicular to the tracks, is approximately 88' with 3 tracks passing beneath the bridge.

Constraints: Cross Street is a two-way street that runs at a gradient of approximately 1% up toward Medford Street. Crossing at the proposed location presents several issues including poor sight lines over the crest of the bridge. The structure of the bridge restricts access when considering an at-grade crossing.

Opportunities: Opportunities are limited due to spatial constraints. Proposed bridge replacement by MassHighway offers an opportunity to integrate the path. There is ample room under the bridge to relocate the freight track.

Options: 1) Integrate a path with the new bridge, or 2) pass beneath the bridge using the rail bed.



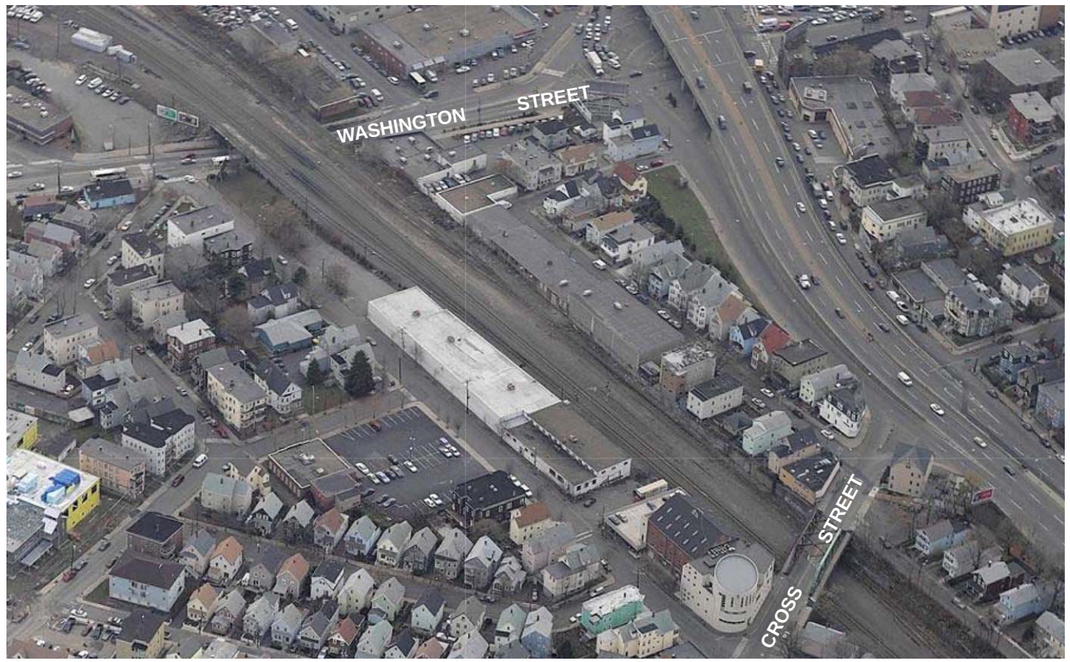


Figure 4.35 View looking south toward Segment 5

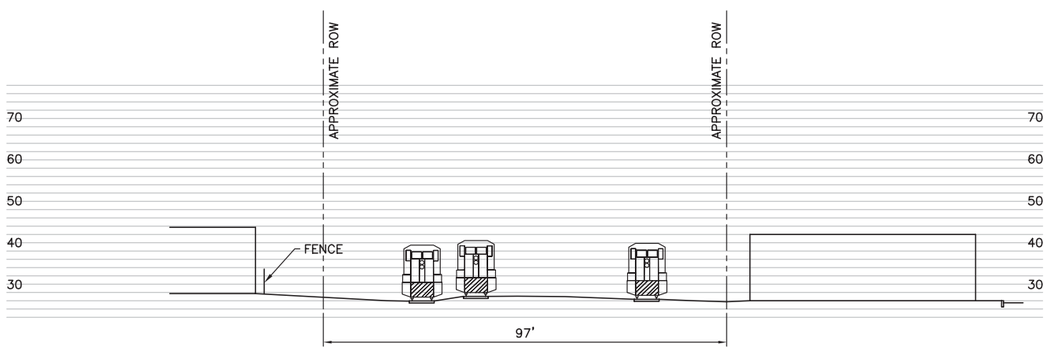


Figure 4.36 Typical cross section at Segment 5

Figure 4.37 Looking south on Alston St.

Figure 4.38 Alston St.

Figure 4.39 North at Medford St. near Alston St.

Figure 4.40 Looking south from Cross St.

4.10 Cross Street to Washington Street - Segment 5

Existing Conditions: Traveling south along the New Hampshire Main Line, the distance from Cross Street to Washington Street is approximately 820 linear feet. The vertical elevation of Cross Street is approximately El. 42.0. The vertical elevation of the tracks above Washington Street is approximately El. 28.0.

Abutting Land Use: The adjacent land use includes residential and industrial uses.

Constraints: The edge of the right-of-way is built out with 1-2 story buildings. The Guilford freight lead is located on the western edge of the right-of-way.

Opportunities: The rail bed is very wide, averaging 104', with only 3 tracks in service providing ample room for the path.

As part of the proposed Green Line extension, there has been consideration to construct a "T" station at this location to serve the surrounding neighborhoods. If a "T" station is built in this area, there may be an opportunity to link the community path to the station.

Options: 1) Shift the freight track to locate the path on the western edge of the right-of-way, 2) elevate the path over the freight line, or 3) utilize adjacent city streets for the path.

Figure 4.41 Washington St. bridge

4.11 Washington Street

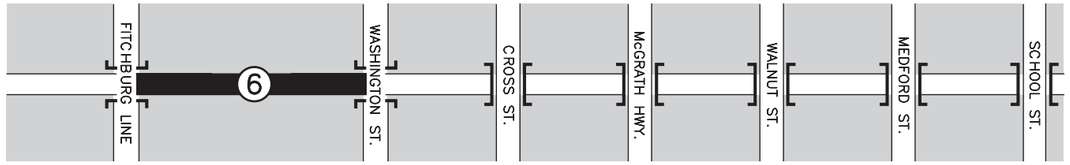
Existing Conditions: The New Hampshire Main Line crosses over Washington Street via a 6-track railroad bridge. The original 4-track railroad bridge, constructed in 1920, was widened to 6 tracks in 1927. Today the bridge measures approximately 106' in width.

Washington Street, passing beneath the New Hampshire Main Line, is approximately 40' wide with a 6' sidewalk on the south side of the street. The vertical elevation of Washington Street is approximately El. 8.0 (with the elevation of the overhead tracks at approximately El. 28.0).

Constraints: Washington Street is a two-way street that depresses underneath the tracks. This section of the street is prone to floods during heavy rains.

Opportunities: With only 4 tracks in service, there is a missing track in the middle of this 6-track bridge. The western track is currently out of service.

Options: 1) Replace the out of service track with a path, or 2) carry the elevated path overhead on a new bridge.



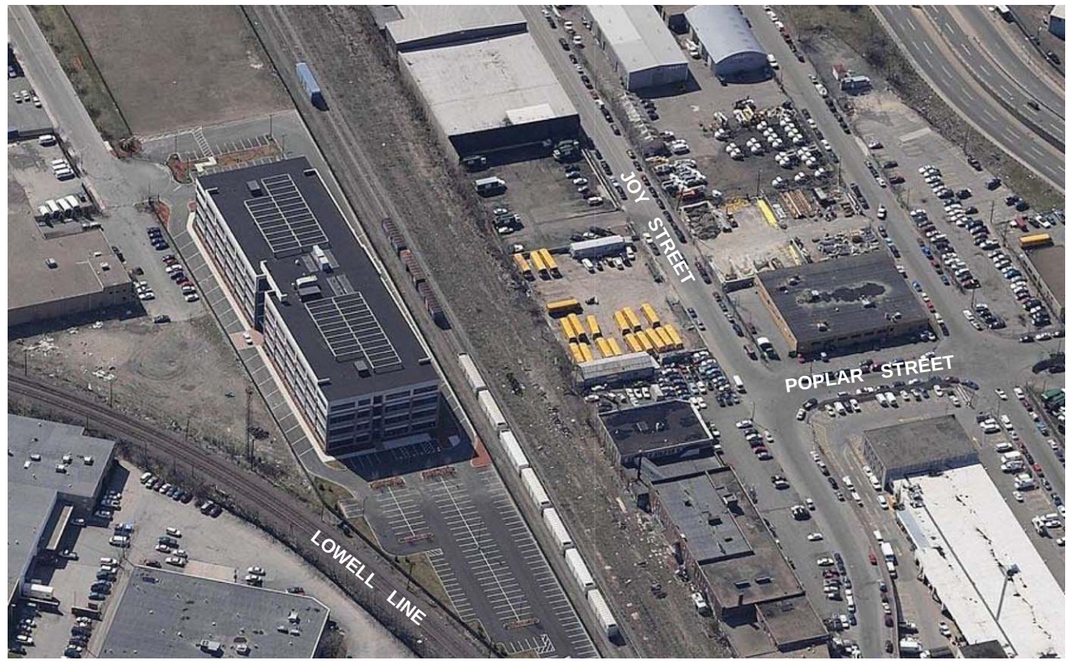


Figure 4.42 View looking south toward Segment 6

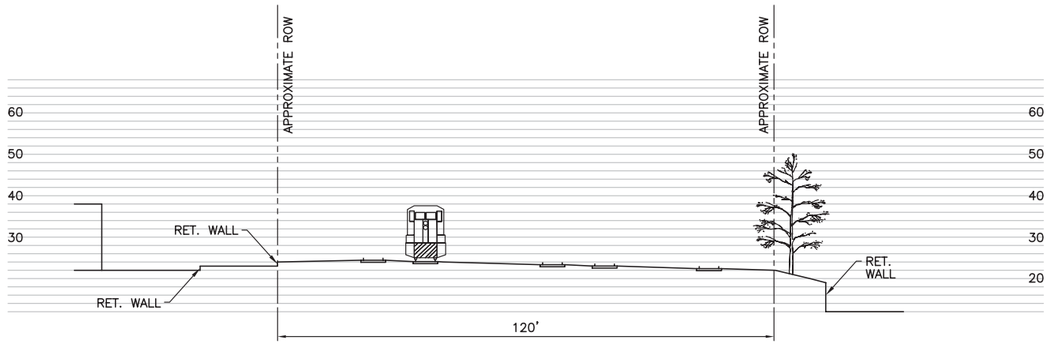


Figure 4.43 Typical cross section at Segment 6

Figure 4.43 Looking east towards the Red Bridge along the Fitchburg Line

4.12 Washington Street to Fitchburg Line - Segment 6

Existing Conditions: Traveling south along the New Hampshire Main Line, the distance from Washington Street to the Fitchburg Line is approximately 2,500 linear feet. The vertical elevation of the tracks between Washington Street and the Fitchburg Line is approximately El. 28.0.

South of Washington Street, the MBTA Commuter Rail turns east and departs the New Hampshire Main Line right-of-way. An in-service freight track is maintained at the eastern edge of the right-of-way with a siding. Remnants of the railroad yards are located along the western edge.

Abutting Land Use: The adjacent land use include commercial uses.

Constraints: Technically, the existing freight tracks are not considered to be abandoned. While this section of the corridor is fairly wide and currently underused, the MBTA is considering the development of a staging yard and maintenance facility as part of the Green Line extension.

Opportunities: This section of the corridor is relatively flat and wide (100'+) providing ample room for the path. The existing railroad yard is currently not in service.

Options: 1) Replace the western most track with a path.

Figure 4.45 Red Bridge (removed 2004)

4.13 Fitchburg Line (former Red Bridge)

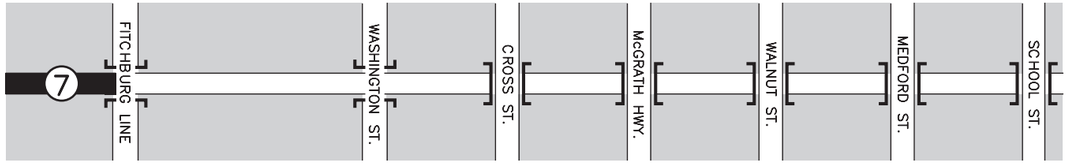
Existing Conditions: The New Hampshire Main Line formerly crossed over the Fitchburg Line and Grand Junction via a steel truss structure. This 3-track railroad bridge was recently removed.

The distance between the bridge abutments, measured perpendicular to the Fitchburg tracks, is approximately 84' with 4 tracks passing between the abutments.

Constraints: Crossing the Fitchburg Line will require a new bridge. Clearance over the railroad will need to consider MBTA plans to 1) raise the tracks to alleviate flooding issues and 2) extend the Green Line.

Opportunities: North Point development eliminates the need for freight access.

Options: 1) Construct new pedestrian / bike bridge over the Fitchburg Line.



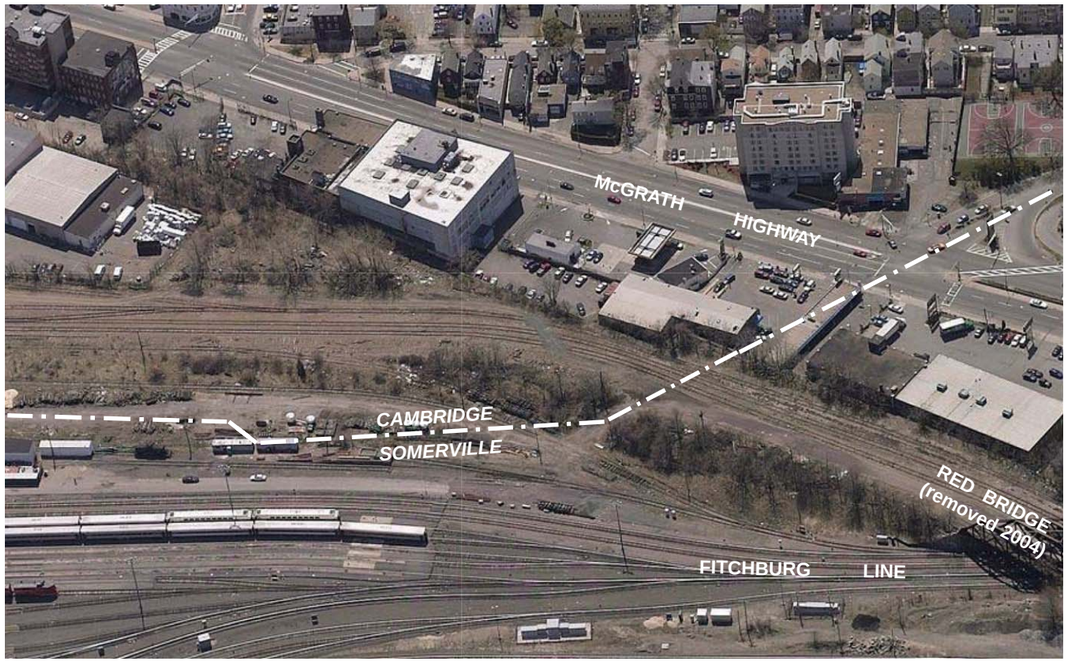


Figure 4.45 View looking south toward Segment 7

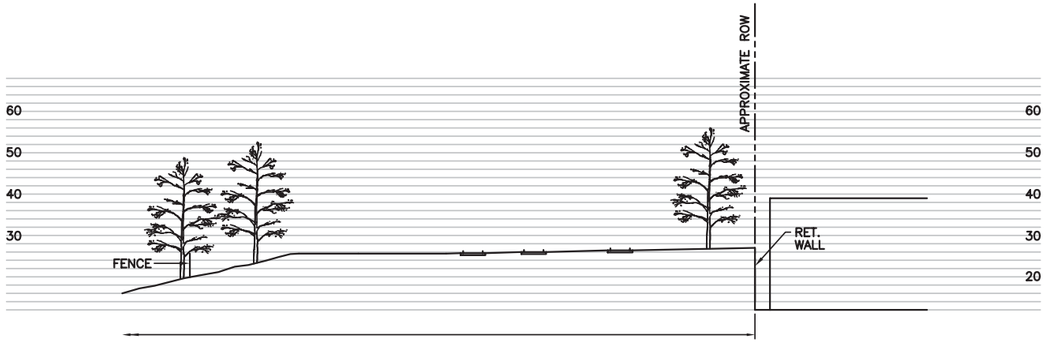


Figure 4.43 Typical cross section at Segment 7

4.14 Fitchburg Line to Cambridge Line - Segment 7

Existing Conditions: Traveling south along the New Hampshire Main Line, the distance from the Fitchburg Line to the Cambridge Line is approximately 465 linear feet. The vertical elevation of the New Hampshire Main Line, above the Fitchburg Line, is approximately El. 28. The vertical elevation of the Fitchburg Line, below the New Hampshire Main Line, is approximately El. 9. The vertical elevation of the tracks at the Cambridge Line is approximately El. 24.5.

Abutting Land Use: The adjacent land use is primarily commercial use.

Constraints: Any path must consider North Point development plans and potential Green Line extension. Additionally, the path should coordinate with the proposed Inner Belt Road connection. This connection will cut across the old rail bed.

Opportunities: This section of the corridor is relatively flat and wide providing ample room for the path. Freight railroad has been discontinued to make way for the North Point development. North Point is planning for path a connection.

Options: 1) Construct at-grade path to link the North Point development.

section 5

Alternatives Analysis

5.0 Alternatives Analysis

For the purposes of comparison and to show a range of potential improvements, Vollmer Associates LLP developed three variations on the May 2001 Alternative 'C'. The goal of this effort was to explore different ways of developing the Community Path while respecting the freight and commuter rail operations within the right-of-way.

5.1 Approach to Alternatives

The May 2001 Alternative 'C' was based on the premise of shifting the Guilford freight lead (from McGrath Highway down to the Red Bridge) in order to accommodate the path. For this study, three alternatives were examined. These alternatives are predicated on the following:

Alternative 1: This alternative was developed to stay out of the existing rail bed and to minimize the need for costly structures. Alternative 1 makes use of the existing embankments and hillside where possible. This option considers departing the right-of-way between Cross Street and Washington Street where no embankment exists;

Alternative 2: This alternative was developed to stay out of the existing rail bed by utilizing the embankment along the MBTA Right-of-way. Where necessary, to improve alignment or avoid impacts to the freight track, new or modified structures are proposed;

Alternative 3: This alternative anticipates the development of the path in conjunction with the proposed Green line extension from Lechmere to Medford. Effectively, this allows movement of the freight track similar to the May 2001 study.

The three alternatives are shown in Figures 5.3 to 5.5. The following sections describe and analyze the alternatives on a street to street basis.

5.2 Description of Alternatives

The following table provides a brief description of each alternative and highlights the notable differences between them.

Crossing/Segment	Alternate 1	Alternate 2	Alternate 3
School Street	Cross at-grade (El. 53)	Cross at-grade (El. 53)	Cross at-grade (El. 53)
Segment 1 School Street to Medford Street	Ramp down to sub-station (El. 34.5)	Path along slope (El. 53 to El. 38.5)	Deck over sub-station as part of new MBTA station (El. 53 to El. 42)

Crossing/Segment	Alternate 1	Alternate 2	Alternate 3
Medford Street	Cross at-grade (El. 57)	Construct new box culvert behind abutment (El. 38.5)	Widen bridge to allow Green Line / underpass (El. 42)
Segment 2 Medford Street to Walnut Street	Travel along top of slope (El. 57 to El. 52)	Travel up slope (El. 38.5 to El. 52)	Use slope with new wall (El. 42 to El. 40)
Walnut Street	Cross at-grade (El. 52)	Cross at-grade (El. 52)	Widen bridge to allow path under (El. 40)
Segment 3 Walnut Street to McGrath Highway	Travel along slope at top of improved wall (El. 52 to El. 51)	Travel along slope with new wall (El. 52 to El. 38)	Use rail corridor (El. 40 to El. 29)
McGrath Highway	Cross by intersection at-grade (El. 51)	Pass beneath using slope/shelf (El. 38)	Use rail corridor (El. 29)
Segment 4 McGrath Highway to Cross Street	Travel along slope at top of improved wall (El. 51 to El. 42)	Travel along slope at top of improved wall (El. 38 to El. 42)	Use rail corridor (El. 29 to El. 28)
Cross Street	Cross at-grade (El. 42)	Cross at-grade (El. 42)	Use rail corridor (El. 28)
Segment 5 Cross Street to Washington Street	Path departs ROW Using sidewalk/path combination	New 1250' structure over freight track (El. 42 to El. 28)	Use rail corridor (El. 28)
Washington Street	N/A	New elevated structure over	Use western track with modified deck
Segment 6 Washington Street to Former Red Bridge	Use rail corridor (El. 28)	Use rail corridor (El. 28)	Use rail corridor (El. 28)
Fitchburg Line	New 135' pedestrian structure (El. 28)	New 135' pedestrian structure (El. 28)	New 135' pedestrian structure (El. 28)
Segment 7 Fitchburg Line to Cambridge Line	Use rail corridor (El. 28 to El. 24.5)	Use rail corridor (El. 28 to El. 24.5)	Use rail corridor (El. 28 to El. 24.5)

Figure 5.1

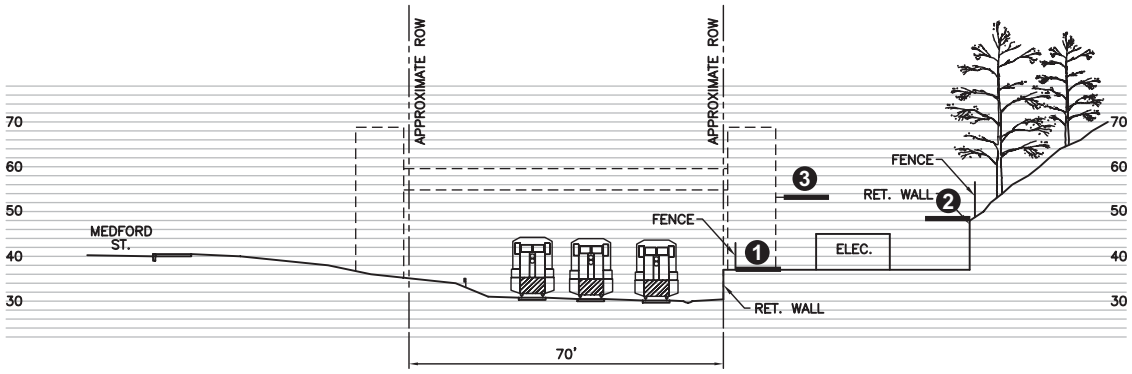
5.3 Alternatives Analysis

A comparison of the alternatives must consider several factors including costs, feasibility, and desired

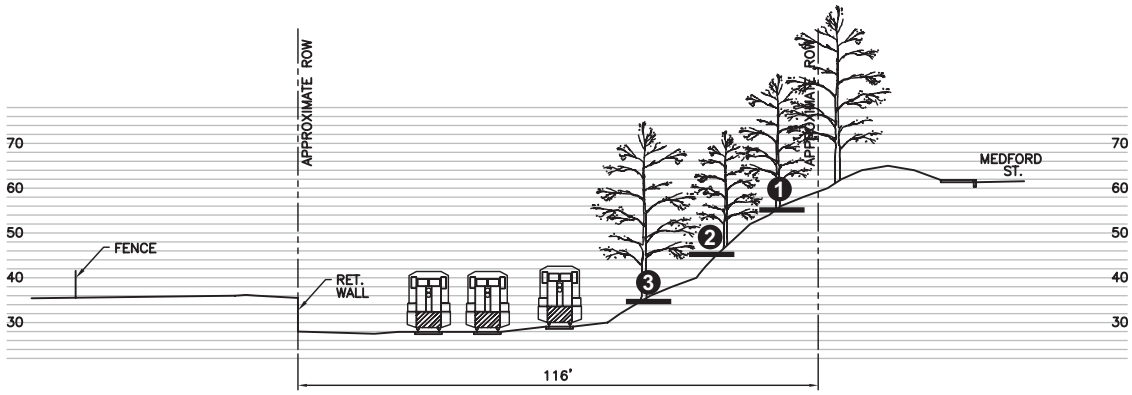
outcome. The following table provides a summary of these factors:

Comparison Factors	Alternate 1	Alternate 2	Alternate 3
Major Structural Elements	8 street crossings, 1850 LF major walls, 135' pedestrian bridge	2 street crossings, modify two bridges, 2570 LF major walls 1300' ped. bridge, 135' pedestrian bridge	2 modified bridges, 720 LF walls, 135' pedestrian bridge
Advantages	Low long term impacts to railroad operations, short term ability to implement based on low impact approach	Moderate long term impacts to railroad operations, improved alignment	Long term impacts to railroad in association with Green Line extension. Medford Street bridge widened to accommodate Green Line
Disadvantages	Short term construction impacts, multiple street crossings and indirect route make undesirable, poor vertical/horizontal alignment	Short term construction impacts, limited street crossings Additional structures	Construction of path tied to schedule of MBTA Green Line extension
Construction Feasibility	Limited access and construction impacts to railroad make implementation highly difficult which may add premiums to overall costs, need for temporary and permanent ROW easements	Limited access and construction impacts to railroad make implementation highly difficult which may add premiums to overall costs, need for temporary and permanent ROW easements, costly structures	Construction coordination with the Green Line extension makes implementation more realistic and should reduce costs
Compatibility with Green Line	Avoids rail bed area.	Relies on elevated structure to avoid rail bed.	Shared improvements done in concert with Green Line Extension
Cost	$4.8 million	$10.1 million	$5.5 million
Recommendation	Desirablity of path not worth pursing	Improved alignment but high costs to avoid track impacts	Recommended alternative based on desired alignment and shared costs with Green Line extension

Figure 5.2



SEGMENT 1
ALTERNATIVES



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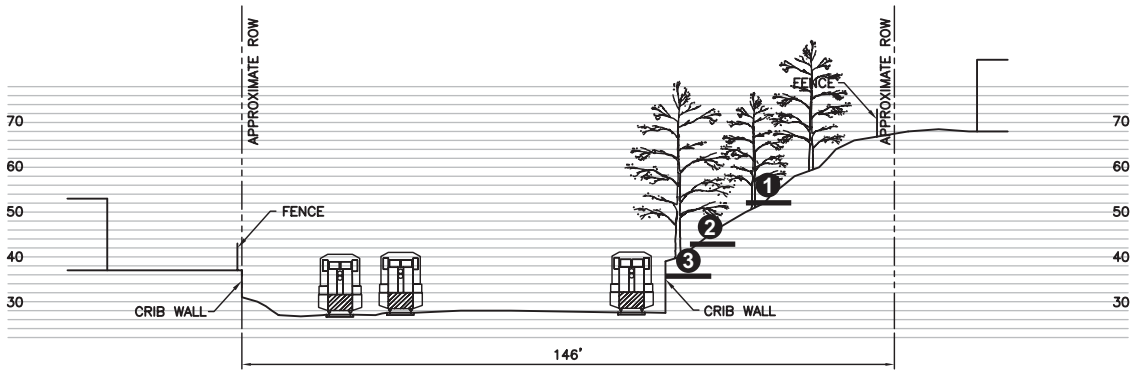
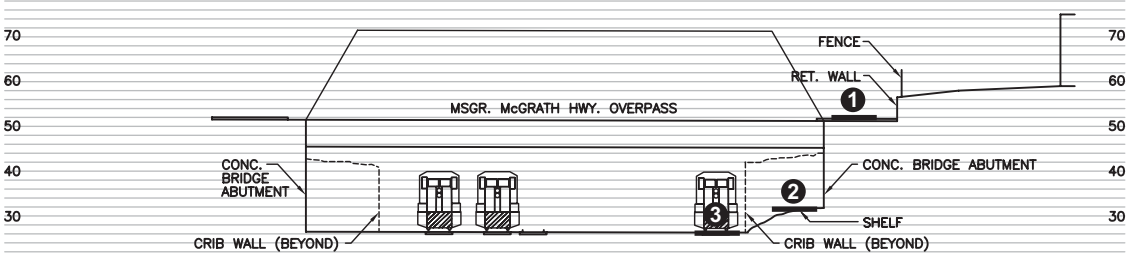
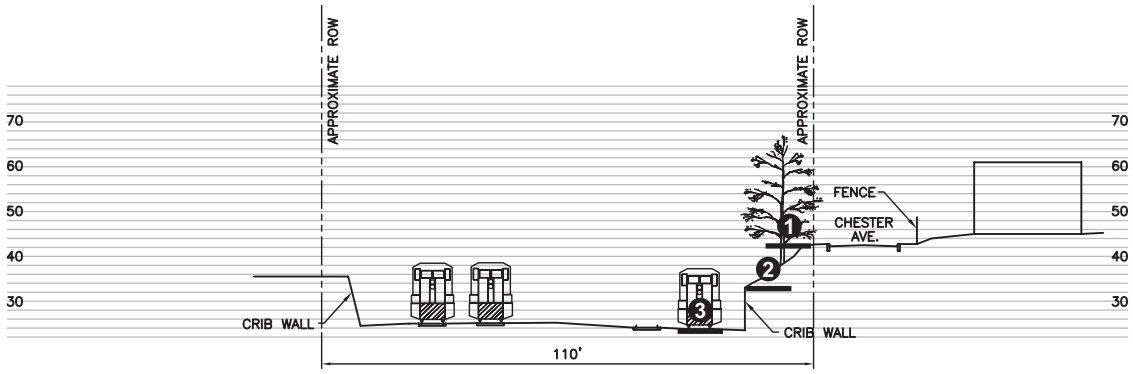


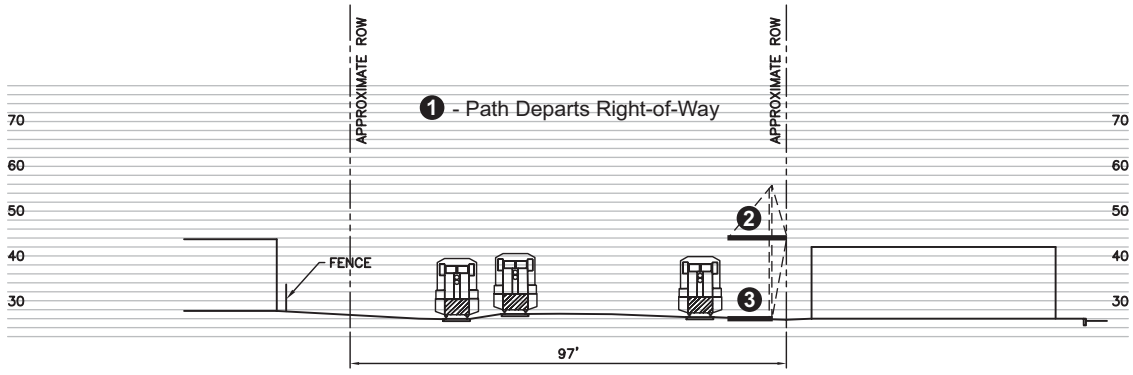
SEGMENT 3
ALTERNATIVES



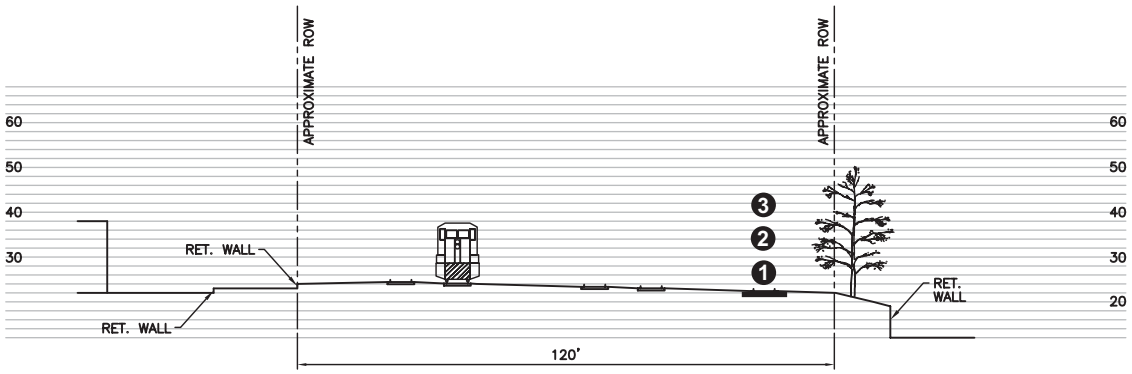
McGRATH HIGHWAY
ALTERNATIVES



SEGMENT 4
ALTERNATIVES



SEGMENT 5
ALTERNATIVES



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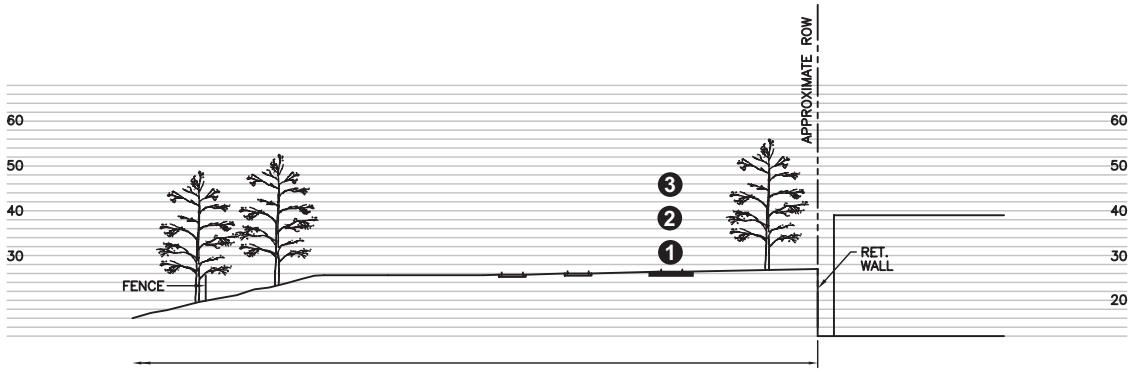

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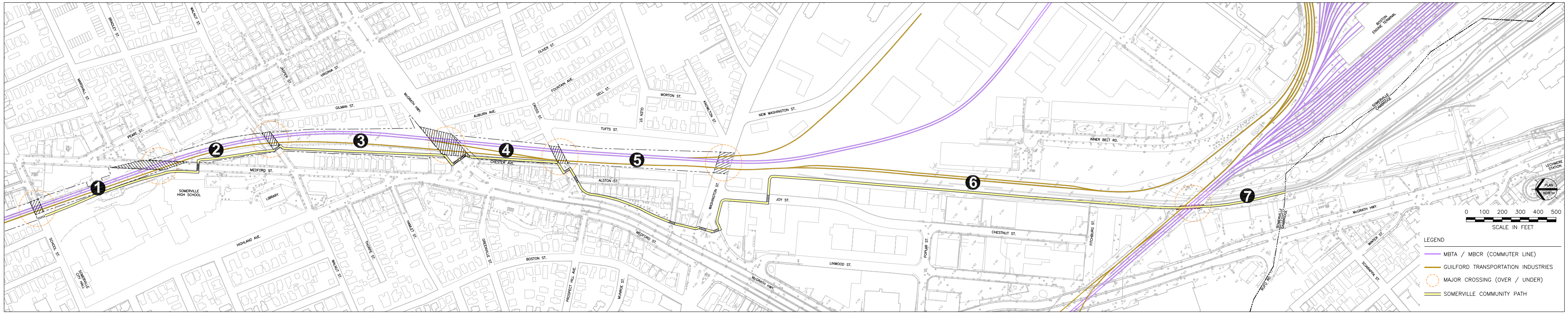

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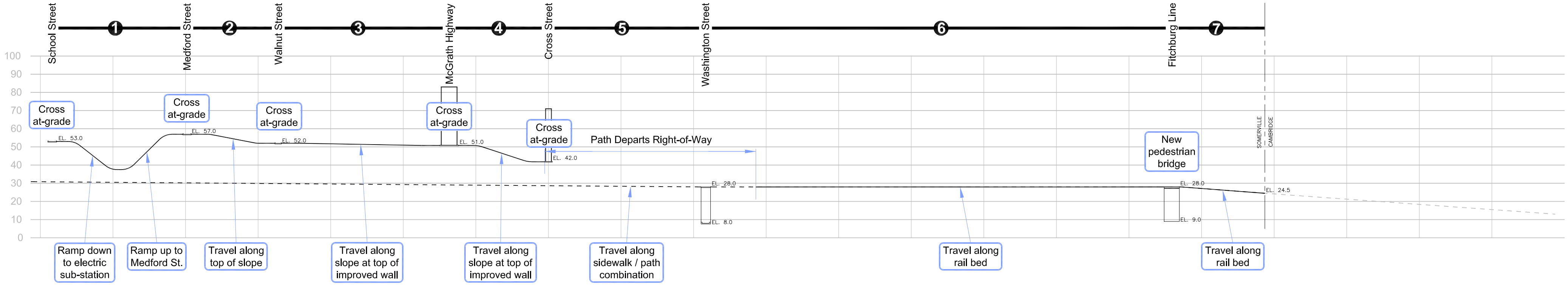

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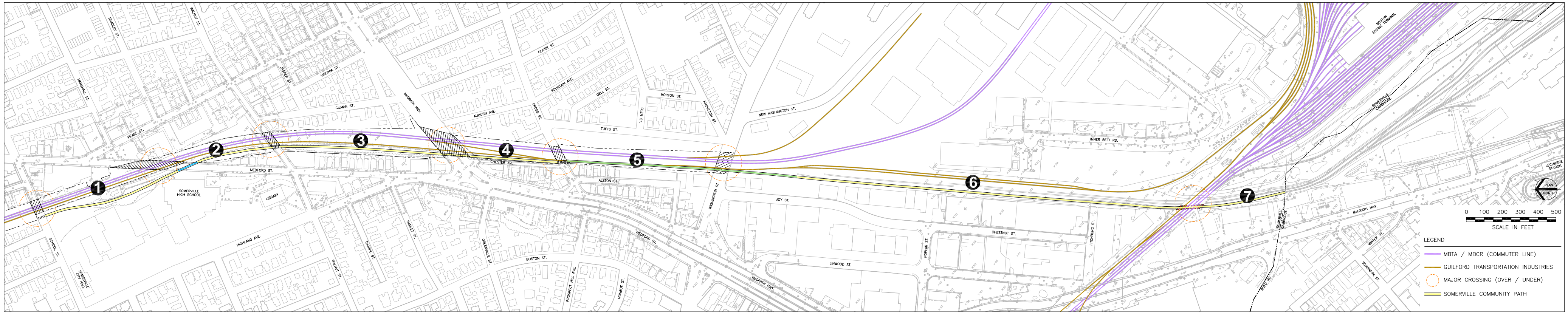
VOLLMER ASSOCIATES LLP

Somerville Community Path Feasibility Study
School Street to Cambridge Line

FIGURE 5.3 - ALTERNATIVE ONE



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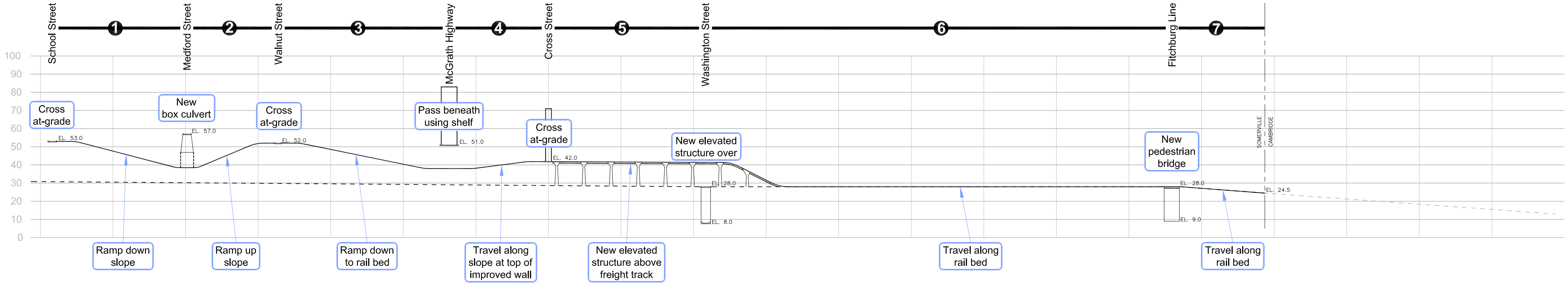

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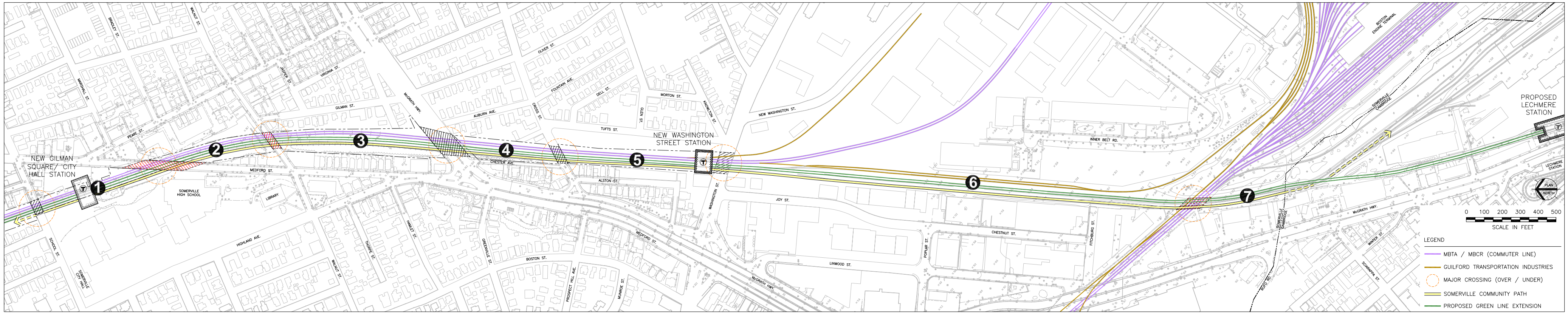
Somerville Community Path Feasibility Study
School Street to Cambridge Line

FIGURE 5.4 - ALTERNATIVE TWO



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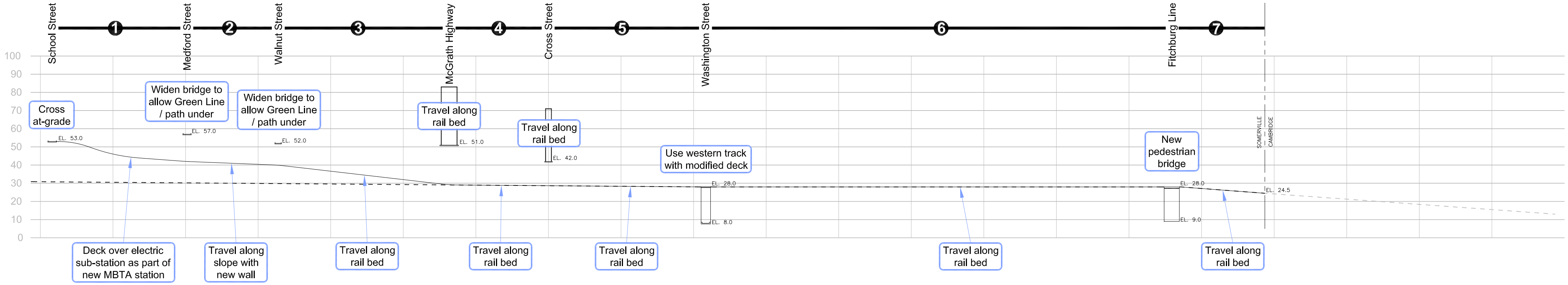

PROFILE
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Vertical Scale: 1" = 40'-0"

VOLLMER ASSOCIATES LLP

Somerville Community Path Feasibility Study
School Street to Cambridge Line

FIGURE 5.5 - ALTERNATIVE THREE

section 6

Recommended Plan

6.0 Recommended Plan

The recommended plan (see Figure 6.1) is a modified version of Alternative #3 that builds on the premise that the MBTA Green Line will be extended from Lechmere Station to Medford. A study of this extension began in 2003, and recent announcements by the Executive Office of Transportation (EOT) indicate that the state is committed to constructing the Green Line extension with an estimated completion date of 2014. Coordinating the Somerville Community Path with the proposed Green Line extension project offers a multitude of benefits to both projects.

This section includes a brief description of the path alignment followed by supporting benefits of the plan.

6.1 Path Alignment

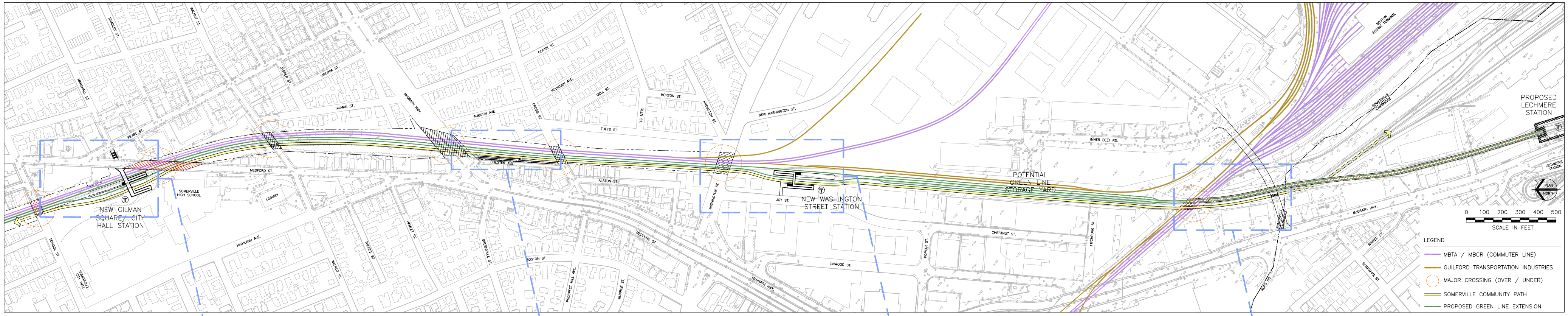
School Street: The path begins at-grade with School Street where future extension of the path to the north will be at the top of the embankment. This also allows access to School Street and City Hall. The Beyond Lechmere: Northwest Corridor Study indicates that the bridge at School Street will need to be rebuilt due to insufficient width between the abutments. If desired, it may be possible to widen the bridge to allow passage of the path below School Street (although a local connection is still desirable).

School Street to Medford Street: In conjunction with a new Gilman Square/City Hall station, the path occupies the space of the current electrical sub-station. This sub-station will be relocated as necessary to accommodate these improvements with maintenance access provided via the community path. A new overpass will link the path and the station with Medford Street.

Medford Street: The Beyond Lechmere Northwest Corridor Study indicates that the bridge at Medford Street will need to be rebuilt due to insufficient width between the abutments. Widening of the bridge to both sides will accommodate both the Green Line as well as the Community Path. This eliminates the need to cross Medford Street or to construct a box culvert, neither of which is considered desirable.

Medford Street to Walnut Street: The path would run along the base of the embankment, rising from below Medford Street to cross at grade with Walnut Street.

Walnut Street: The Walnut Street bridge, which was recently reconstructed in 2003 provides adequate width for both the Commuter Rail and the Green Line, and therefore will not be replaced. Widening at this location to accommodate the path underneath would be extremely difficult without taking the business at the corner of Walnut Street and Medford Street. The provision of high retaining walls extending out from either side of the existing abutment will allow the path to cross Walnut Street at-grade. This community connection is desired.



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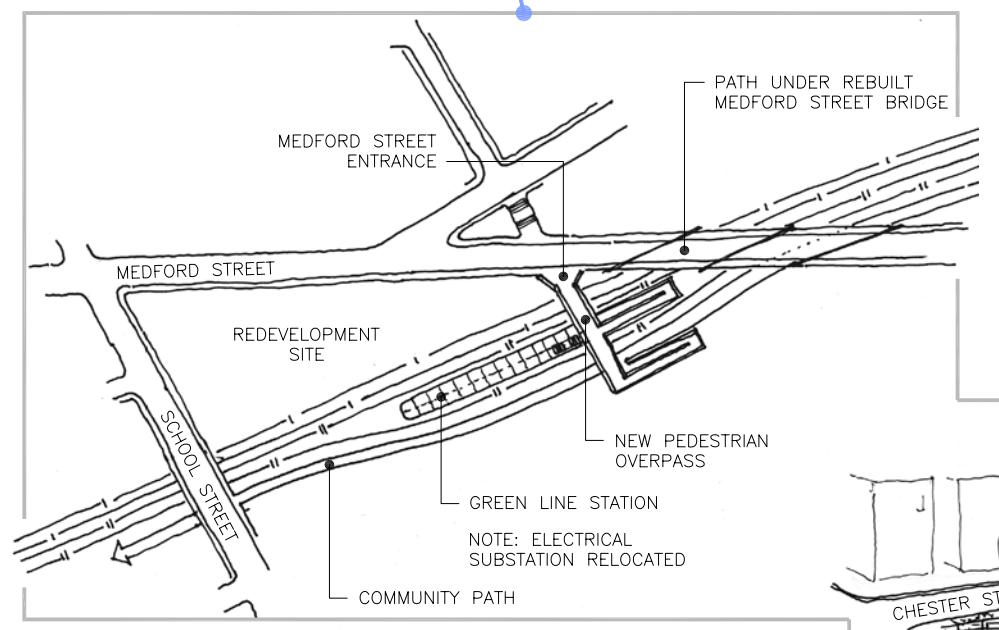
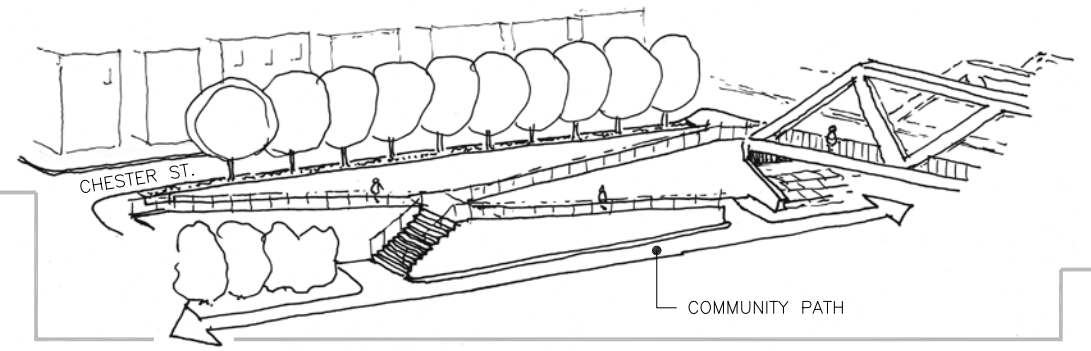
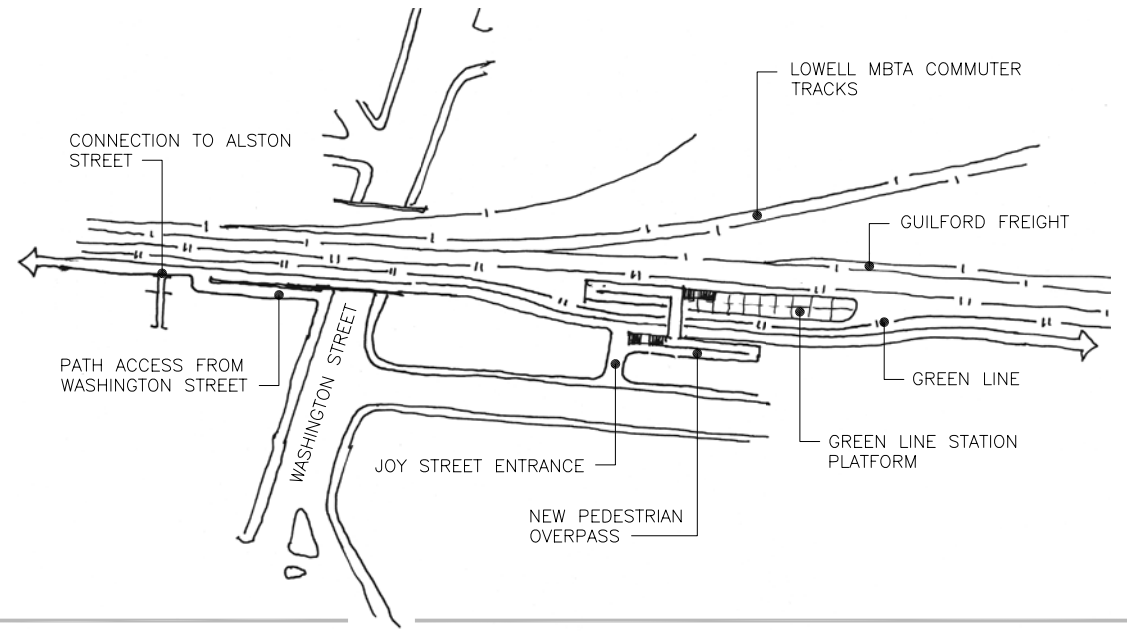


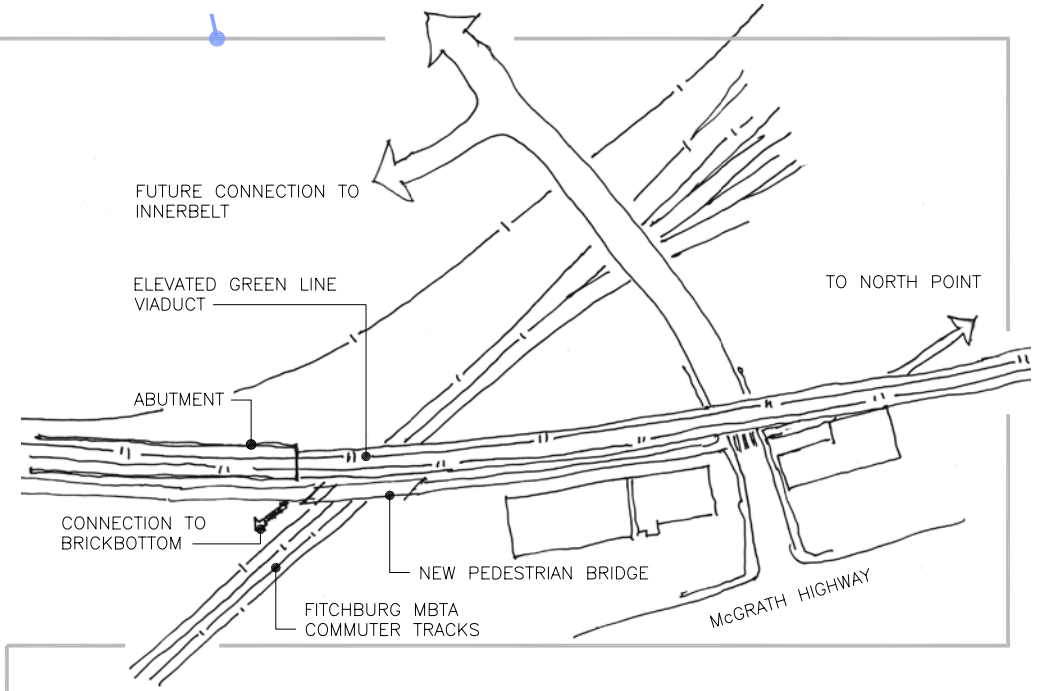
GILMAN SQUARE / CITY HALL STATION



McGRATH HIGHWAY / CROSS STREET ACCESS



WASHINGTON STREET STATION

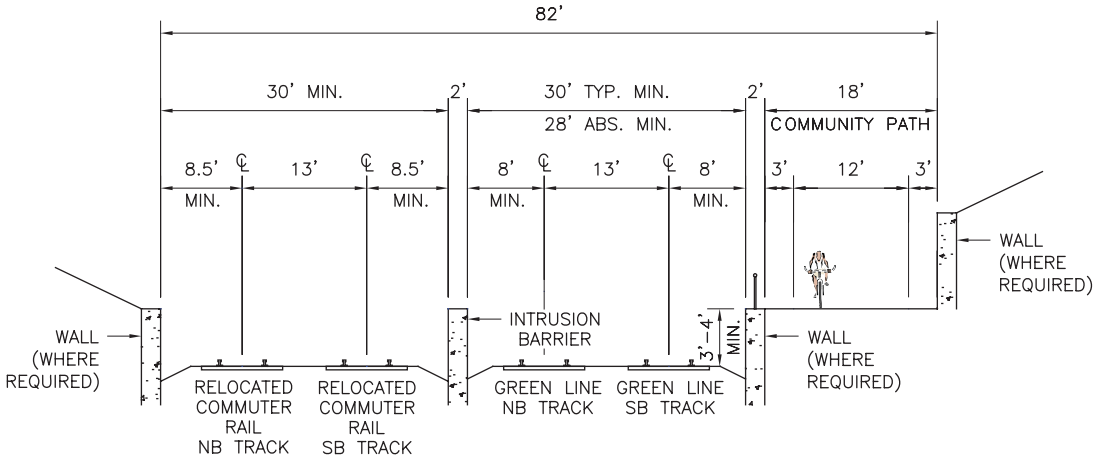


CAMBRIDGE LINE

VOLLMER ASSOCIATES LLP

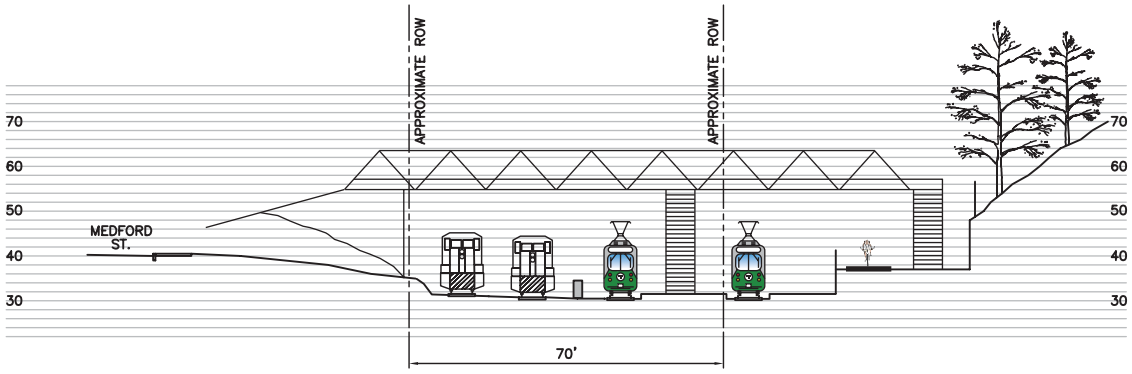
Somerville Community Path Feasibility Study
School Street to Cambridge Line

FIGURE 6.1 - RECOMMENDED PLAN

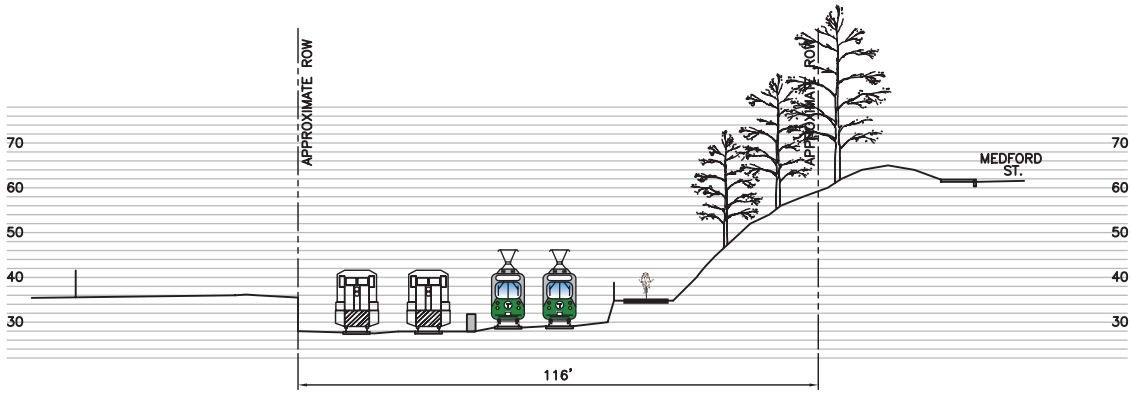


TYPICAL CORRIDOR SECTION

SCALE: 1" = 20'-0"



SEGMENT 1
RECOMMENDED



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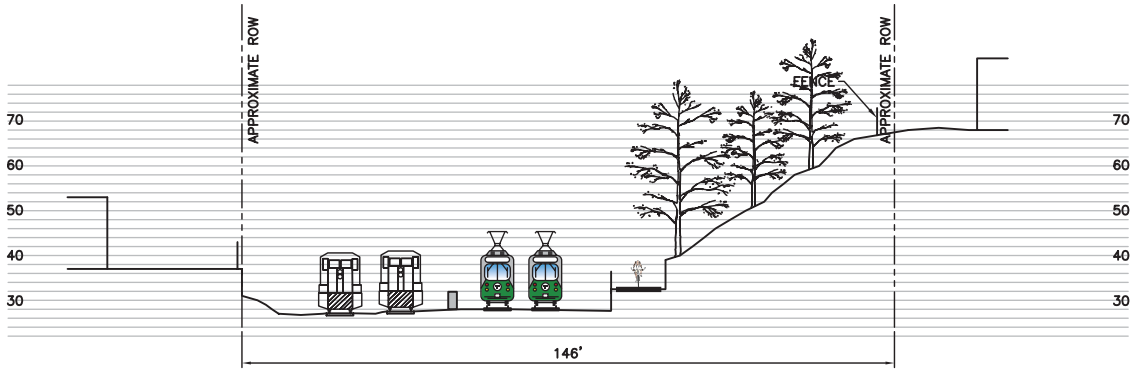
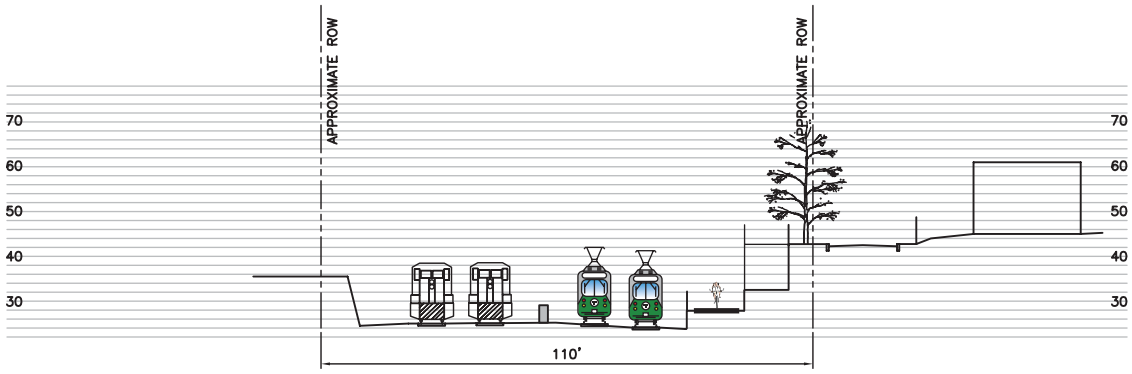
RECOMMENDED

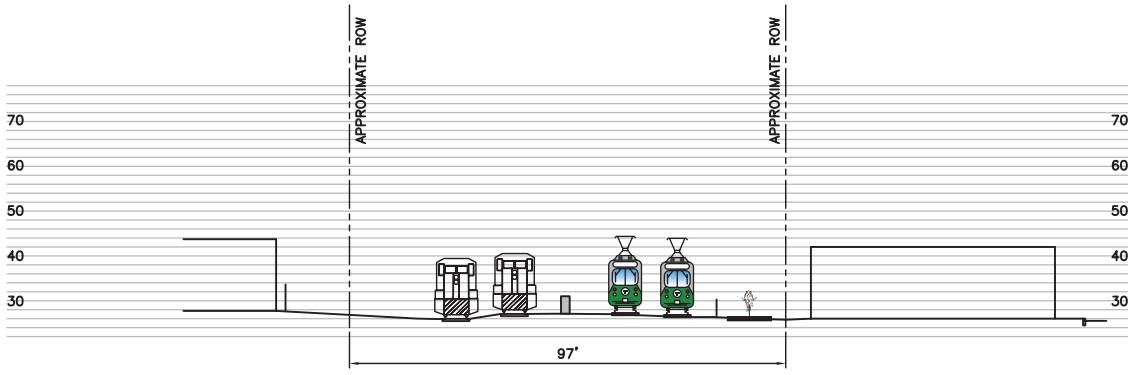


SEGMENT 3
RECOMMENDED

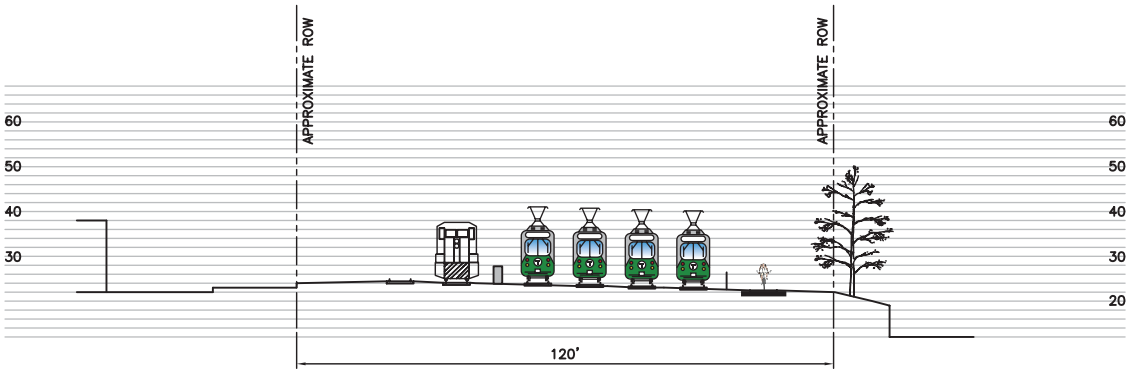
McGRATH HIGHWAY
RECOMMENDED



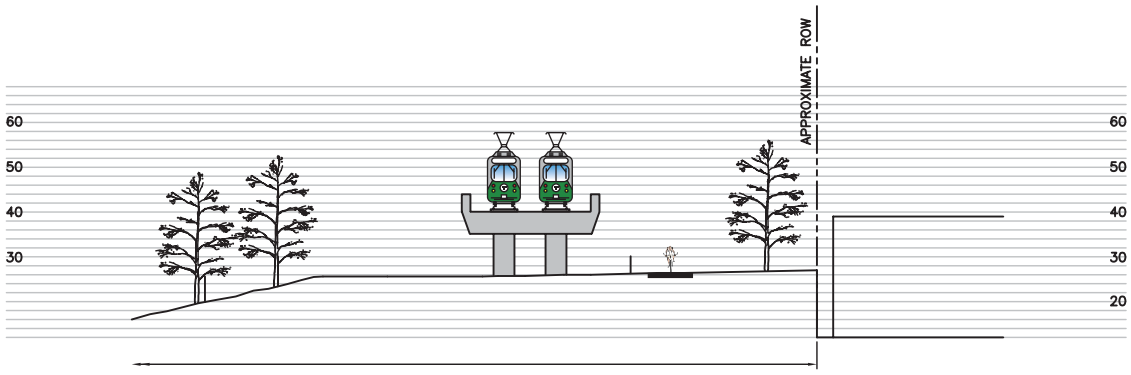
SEGMENT 4
RECOMMENDED



SEGMENT 5
RECOMMENDED



SEGMENT 6
RECOMMENDED



SEGMENT 7
RECOMMENDED

Walnut Street to McGrath Highway: From Walnut Street, the path will traverse down the side of the slope, supported by new retaining walls until it moves out into the rail corridor and takes the area currently occupied by the freight lead track.

McGrath Highway: The proposed path will pass beneath the McGrath Highway bridge, occupying the western edge of the rail corridor where the freight track is currently located.

McGrath Highway to Cross Street: The path will continue along the western edge of the rail corridor at or near the existing elevation of the corridor. Utilizing the embankment adjacent to Chester Street, a system of ramps and stairs is proposed to provide access to/from McGrath Highway and Cross Street. Additionally, room for a buffer planting at the top would enhance the Chester Street neighborhood.

Cross Street: The proposed path would pass beneath the Cross Street bridge.

Cross Street to Washington Street: The proposed path would occupy the western edge of the rail corridor.

Washington Street: The path is proposed to cross the Washington Street bridge using the western most track. The Green Line is envisioned using the next two spans of this 6 track bridge. A ramped connection behind the Cataldo Ambulance service building is proposed to provide access to the path from Washington Street

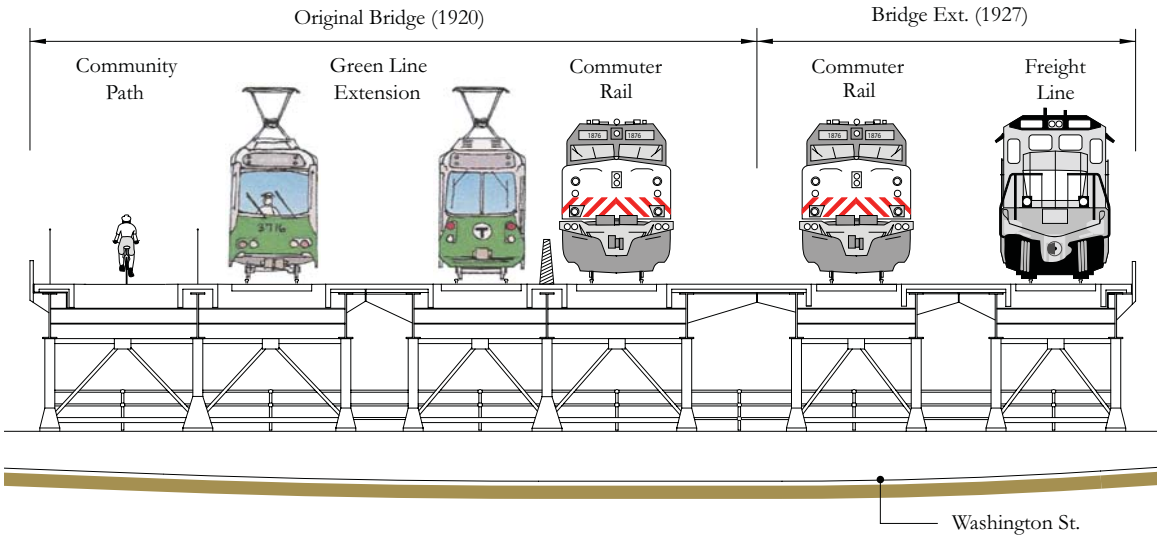


Figure 6.2 Washington Street Bridge

Washington Street to Fitchburg Line: In conjunction with a new Washington Street station, the path would continue along the western side of Yard 8. The main entrance to the station, and to the path, would be off of Joy Street.

Fitchburg Line: Since the Red Bridge was removed, a new pedestrian bridge is proposed to allow the path to cross over the Fitchburg line. The Green Line will also require a structure to cross at this location. This structure is envisioned to be an extension of the viaduct from Lechmere Station.

Fitchburg Line to Cambridge Line: The path is illustrated along the western edge of the corridor until it crosses a new street. This street is taken from the Inner Belt Access Study and provides additional access to the Southern Inner Belt District. The path will cross this new street at grade and will then pass beneath the Green Line, where it will connect to the proposed North Point Development path. The Green Line is illustrated as an elevated structure from the new Lechmere Station to the north side of the Fitchburg Line. This would allow installation of the Inner Belt Road Extension, and will permit the passage of the Community Path from the west to the east of the Green Line.

6.2 Construction Feasibility

There are a number of challenges to developing the Community Path along this section of the New Hampshire Main Line. Gaining access into the corridor is constrained by the surrounding slopes and buildings, and will be limited to existing access points. The removal of the freight track, construction next to live rail operations, and safety concerns related to construction near high speed trains place an unusually high burden of proof on a simple path project. Other challenges include:

- Limited Right-of-Way
- Steep embankments
- Close proximity of abutters
- Risk of damage to buildings/structures
- Gaining access to corridor
- Maintenance of rail operations

The benefit of the recommended plan is that the Green Line requires removal of the freight track and relocation of the commuter rail to the eastern side of the corridor. Constructing the Community Path as a component of the larger project makes sense in terms of improved constructability and oversight through the operating agency, the MBTA.

6.3 Shared Benefits

As shown in the plan, the path and the Green Line would mutually benefit each other in a number of ways. These include:

- Enhancement of the corridor
- Increased users
- Improved security and safety for users
- Greater community connections

In essence, the Community Path will serve as a major circulation route linking neighborhoods to and from the new Green Line stations, as well as a recreational trail connecting points north and south. Additionally, the path offers a means of accessing the rail corridor for maintenance and emergency purposes.

6.4 Shared Costs

A major benefit of this alternative is that the costs are shared between the Community Path and the Green Line extension. This includes the costs of displacing the freight line and upgrading the Medford Street bridge, as well as maintenance and operating costs.

6.5 Green Line Stations

The MBTA is proposing to provide un-staffed stations (fares are paid on board) that consist of simple center island platforms with a partial canopy. This is common to many of the outlying Green Line stops and works well for this corridor. The path will provide an extra level of value by connecting multiple neighborhoods directly to each station. The need for "super stations" that support major bus terminals is therefore not warranted.

6.6 Community Access Points

To get the maximum benefit from the path, numerous connections to the surrounding streets and neighborhoods are envisioned. Along the path, the plan shows connection points at the following:

- School Street
- Medford Street
- McGrath Highway/Cross Street
- Alston Street
- Washington Street
- Joy Street
- Brickbottom

6.7 Future Connections

The path is situated with the understanding that the path will extend both north and south. To the north, the path is located on the west side of the rail corridor and will eventually be extended up to Central Street. To the south, the plan illustrates the path crossing beneath the Green Line viaduct (coming from the new Lechmere Station) where it would link into the proposed North Point Development. The plan also shows a potential extension of the Inner Belt Road out to the McGrath Highway as proposed by the Inner Belt Access Study. There may also be potential to link a corridor up along the Haverill Line to Yard 21 and the Mystic River.

appendix A

Cost Estimates

Cost Estimates

ALTERNATE #1

Segment	Project Type	Length (ft)	Unit	Unit Cost	Total Cost
School Street	At-grade crossing	50	LF	200	$10,000
Segment 1	Bottom of embankment, access road	720	LF	500	$360,000
Medford Street	At-grade crossing	130	LF	200	$26,000
Segment 2	Along embankment	450	LF	2000	$900,000
Walnut Street	At-grade crossing	50	LF	200	$10,000
Segment 3	Along embankment, transition down	900	LF	2000	$1,800,000
McGrath Highway	At-grade crossing	150	LF	100	$15,000
Segment 4	Transition up, top of embankment	500	LF	2000	$1,000,000
Cross Street	At-grade crossing	200	LF	200	$40,000
Segment 5	Sidewalk/path combination	700	LF	100	$70,000
Washington Street	At-grade crossing	110	LF	200	$22,000
Segment 6	Use railbed	2850	LF	100	$285,000
Fitchburg Line	New bridge over R.R.	135	LF	1500	$202,500
Segment 7	Use railbed	470	LF	100	$47,000
Total		7415			$4,787,500

ALTERNATE #2

Segment	Project Type	Length (ft)	Unit	Unit Cost	Total Cost
School Street	At-grade crossing	50	LF	200	$10,000
Segment 1	Along embankment	720	LF	2000	$1,440,000
Medford Street	New Box Culvert	130	LF	6000	$780,000
Segment 2	Along embankment	450	LF	2000	$900,000
Walnut Street	At-grade crossing	50	LF	200	$10,000
Segment 3	Along embankment, transition down	900	LF	2000	$1,800,000
McGrath Highway	Underpass	150	LF	200	$30,000
Segment 4	Transition up, top of embankment	500	LF	2000	$1,000,000
Cross Street	At-grade crossing	60	LF	200	$12,000
Segment 5	Elevated structure	820	LF	4000	$3,280,000
Washington Street	Elevated structure	80	LF	4000	$320,000
Segment 6	Use railbed	2480	LF	100	$248,000
Fitchburg Line	New bridge over R.R.	135	LF	1500	$202,500
Segment 7	Use railbed	470	LF	100	$47,000
Total		6995			$10,079,500

ALTERNATE #3

Segment	Project Type	Length (ft)	Unit	Unit Cost	Total Cost
School Street	At-grade crossing	50	LF	200	$10,000
Segment 1	Along embankment	720	LF	2000	$1,440,000
Medford Street	New Box Culvert	130	LF	6000	$780,000
Segment 2	Along embankment	450	LF	2000	$900,000
Walnut Street	New Box Culvert	50	LF	6000	$300,000
Segment 3	Transition out into railbed	900	LF	750	$675,000
McGrath Highway	Relocate freight, use railbed	150	LF	550	$82,500
Segment 4	Relocate freight, use railbed	500	LF	550	$275,000
Cross Street	Relocate freight, use railbed	60	LF	550	$33,000
Segment 5	Relocate freight, use railbed	820	LF	550	$451,000
Washington Street	Use rail bridge	80	LF	400	$32,000
Segment 6	Use railbed	2480	LF	100	$248,000
Fitchburg Line	New bridge over R.R.	135	LF	1500	$202,500
Segment 7	Use railbed	470	LF	100	$47,000
Total		6995			$5,476,000

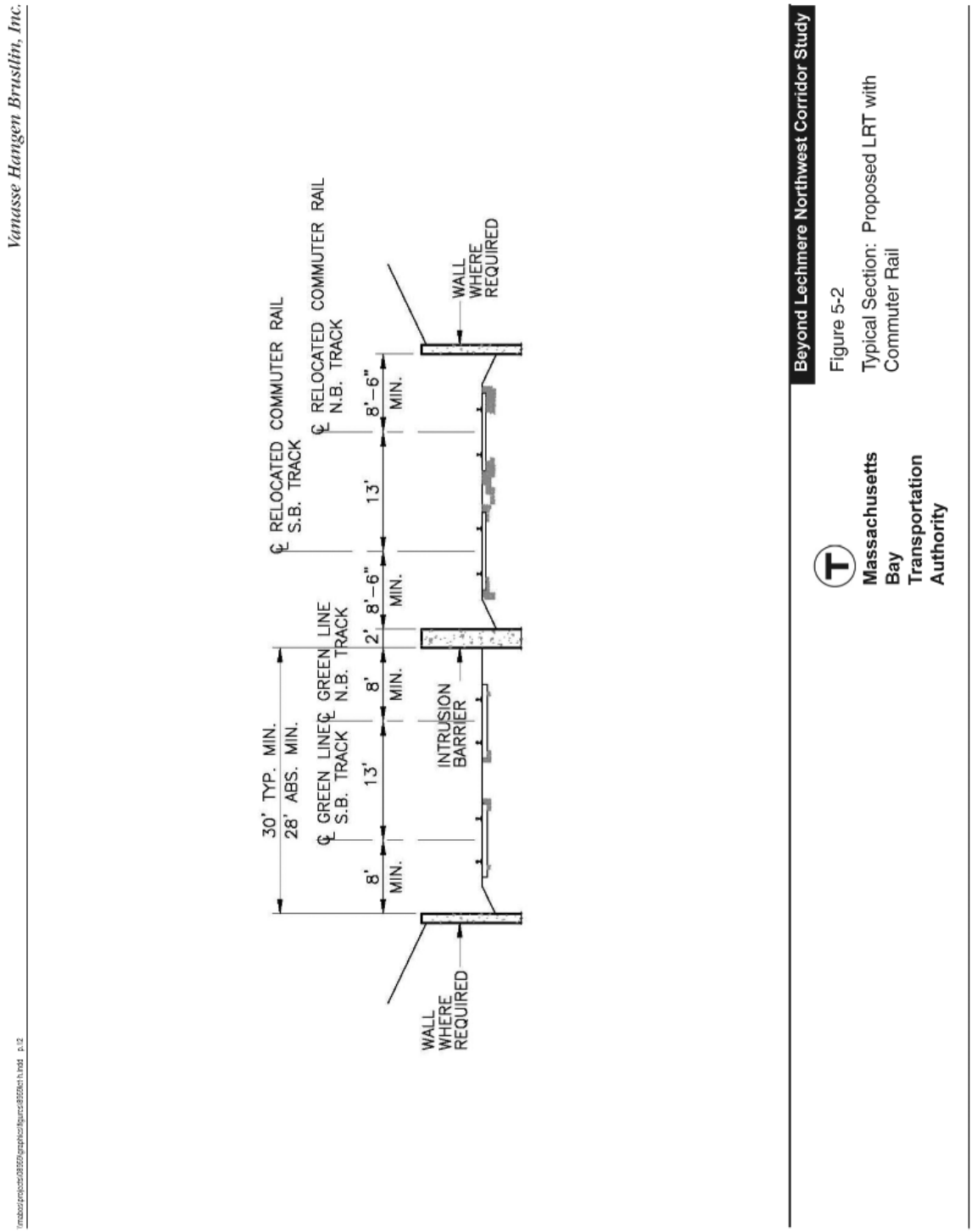
ALTERNATE #3-Modified

Segment	Project Type	Length (ft)	Unit	Unit Cost	Total Cost
School Street	At-grade crossing	50	LF	200	$10,000
Segment 1	Along Gillman Station (shared cost*)	720	LF	1000	$720,000
Medford Street	New Bridge (shared cost*)	130	LF	6000	$780,000
Segment 2	Along embankment	450	LF	2000	$900,000
Walnut Street	New Bridge (shared cost*)	50	LF	6000	$300,000
Segment 3	Use railbed*	900	LF	200	$180,000
McGrath Highway	Use railbed*	150	LF	200	$30,000
Segment 4	Use railbed*	500	LF	200	$100,000
Cross Street	Use railbed*	60	LF	200	$12,000
Segment 5	Use railbed*	820	LF	200	$164,000
Washington Street	Use rail bridge	80	LF	400	$32,000
Segment 6	Use railbed	2480	LF	100	$248,000
Fitchburg Line	New bridge over R.R.	135	LF	1500	$202,500
Segment 7	Use railbed	470	LF	100	$47,000
Total		6995			$3,725,500

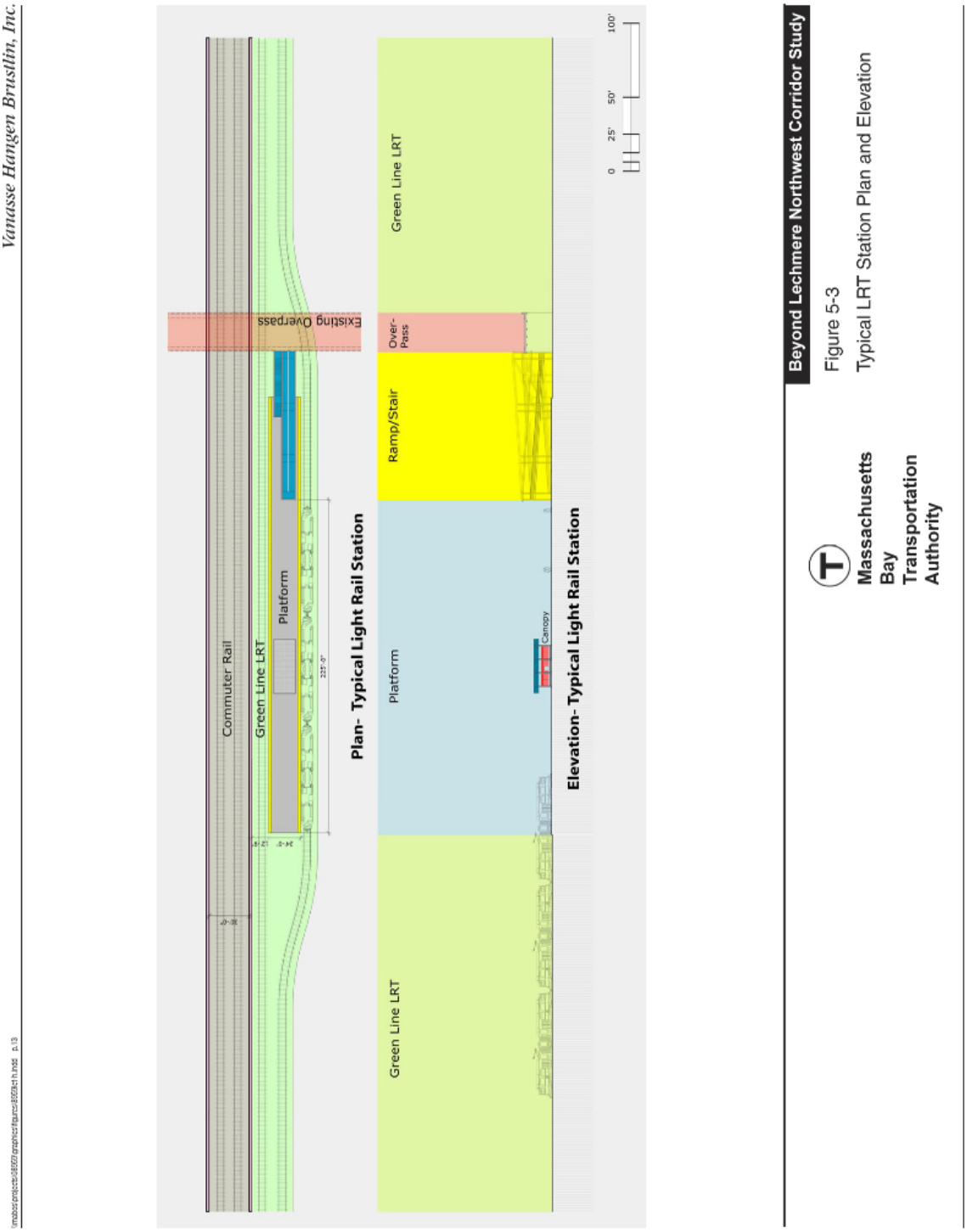
*New Gillman Square Station, Medford St. / Walnut St. bridge replacements and freight track relocation completed as part of Green line extension to Medford.

appendix B

Typical Light Rail Station

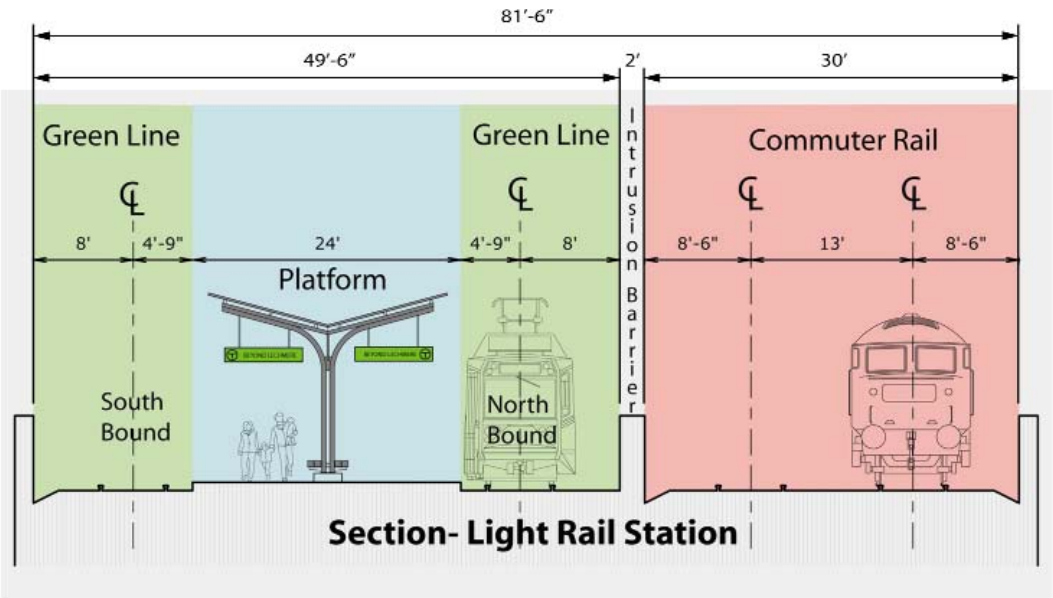


Source: Vanasse Hangen Brustlin, Inc., Beyond Lechmere - Northwest Corridor Study, August 2005.



Source: Vanasse Hangen Brustlin, Inc., Beyond Lechmere - Northwest Corridor Study, August 2005.

Vanasse Hangen Brustlin, Inc.



Beyond Lechmere Northwest Corridor Study

Figure 5-4
Typical LRT Station Section

Massachusetts Bay Transportation Authority

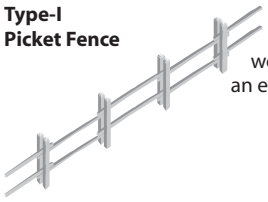
Source: Vanasse Hangen Brustlin, Inc., Beyond Lechmere - Northwest Corridor Study, August 2005.

appendix C

Typical Fencing Styles

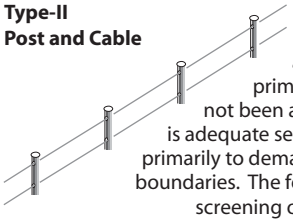
Typical Fencing Styles

Type-I
Picket Fence



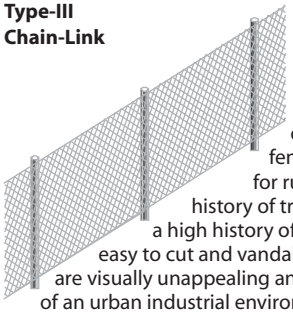
Where trespassing is not as much of a problem, a low wood rail fence can still serve as an effective reminder to trail users to stay off the tracks.

Type-II
Post and Cable



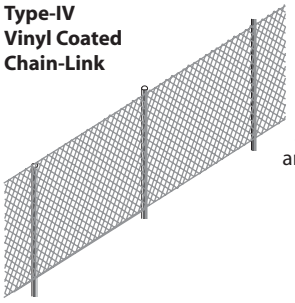
This inexpensive fence is occasionally requested by a railroad or used on a RWT primarily where trespassing has not been an historical problem, there is adequate setback, and the fence serves primarily to demarcate the railroad property boundaries. The fence does not provide any screening or anti-trespassing features.

Type-III
Chain-Link



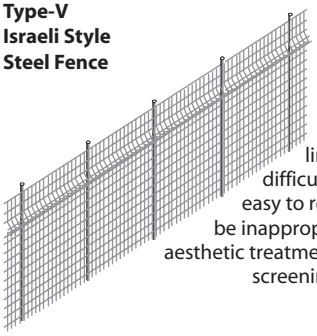
Chain-link fences are popular due to their effectiveness in keeping trail users off the tracks, relative low cost, and ease of maintenance. Chain-link fence may not be appropriate for rural areas where there is no history of trespassing, or for areas with a high history of trespassing, since it is very easy to cut and vandalize. Most chain-link fences are visually unappealing and tend to project an image of an urban industrial environment. For this reason, trail designers should explore using other, more appealing types of fences whenever possible.

Type-IV
Vinyl Coated
Chain-Link



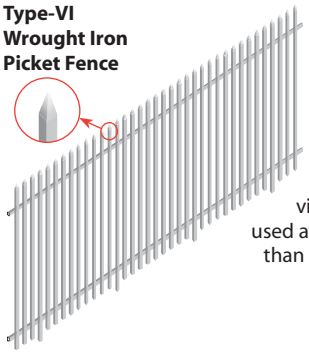
Similar to Type II, but with either a plastic woven fabric or wood battens in the chain-link material providing a solid-type barrier to help catch debris and provide wind and visual buffering.

Type-V
Israeli Style
Steel Fence



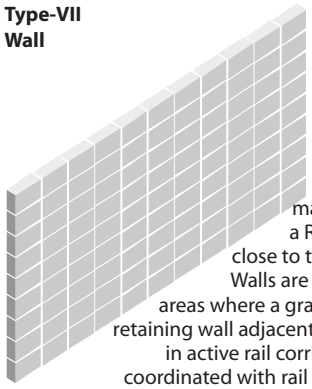
Sometimes referred to as "israeli-style" fencing for its use in Israel to protect kibbutzs, this product is more expensive than chain link, difficult to vandalize, difficult to scale, and relatively easy to repair if it is cut. It would be inappropriate for areas requiring aesthetic treatment, and provides limited screening or buffering benefits.

Type-VI
Wrought Iron
Picket Fence



This is the ultimate in vandal resistant fencing, and is used in locations that have a history of trespassing. It is virtually impossible to cut and difficult to scale. Because of its cost and visual impact, it is typically used at specific locations rather than along the entire corridor.

Type-VII
Wall



Very rarely used due to its cost and visual impact, solid concrete block walls are virtually indestructable and offer complete buffering and screening from rail debris or trains. A wall may be appropriate where a RWT must be placed very close to tracks for short distances. Walls are most commonly used in areas where a grade separation requires a retaining wall adjacent to the trail. Wall design in active rail corridors should be carefully coordinated with rail engineers, because they can have an effect on the structural integrity of the rail bed, alter drainage patterns in the rail corridor, and, in some circumstances, impede railroad access by railroad maintenance equipment.

Source: U.S. Department of Transportation, Rails-with-Trails: Lessons Learned, August 2002.

appendix D

Articles Related to Green Line Extension

Articles Related to Green Line Extension

Curtatone Hails State's Historic Green Line Decision

Mayor Says Extension Will Revitalize Union Square, East Somerville, Give Residents the Transit Service They Deserve

SOMERVILLE - Mayor Joe Curtatone lauded the state's decision to extend the Green Line into Somerville, saying the move was long overdue for Somerville residents and predicting dramatic economic growth for the entire East Somerville/East Cambridge region.

"This is a truly historic day for the city of Somerville," said Curtatone. "Most of us are Red Sox fans so we're used to waiting. Like Red Sox fans, we've waited decades for a return to past glory, in this case the streetcar days of Union Square. And like Red Sox fans, we can't quite believe we've finally won."

Curtatone made his remarks at a press conference held in Union Square by state officials to announce the state had decided to move forward with the Green Line extension and several other transit projects. Lt. Governor Kerry Healy, Commonwealth Development Secretary Douglas Foy, and State Transportation Secretary John Cogliano attended the event. State Senator Jarret Barrios, Representative Tim Toomey, Representative Patricia Jehlen, and several members of the Somerville Board of Aldermen also attended, as did Medford Mayor Michael McGlynn and members of the Medford City Council. Congressman Michael Capuano could not attend due to votes in Washington but sent comments read by Curtatone.

"More than half a century after the state tore up our streetcar tracks and built highways through our neighborhoods, we're getting back the rail service we deserve," said Curtatone. "Union Square can again become the bustling commercial area it once was and East Somerville can become an engine of economic growth for the Metro Boston region."

Four different sets of train tracks carrying eight different rail lines slice through Somerville neighborhoods but the city has only one stop - the Red Line station in Davis Square. The state agreed to extend the Green Line to Somerville and Medford as part of a Big Dig-related agreement made with environmentalists in the 1980's. Recently, state officials, citing cost considerations, re-assessed each of the remaining projects to ascertain which were cost-efficient and which would yield the clean air benefits necessary under the agreements and under federal law. It also took into consideration the economic development potential of each project.

A report released earlier this month by the MBTA's own consultants revealed that the Green Line extension would yield 30,000 more transit trips per day and would cut vehicle miles by 64,000 per day. It also showed the extension, which would begin at Lechmere station and would run along only about four miles of existing lines to West Medford, would have extremely low costs per mile.

"The MBTA's report showed this project delivered a lot of bang for very little buck," said Curtatone. "Add to that the tremendous economic potential of the underutilized industrial land in this area, and you have a real win-win for the state and the city."

The Somerville Chamber of Commerce has estimated the Green Line extension would create three billion dollars in economic activity.

Curtatone singled out Healy and Foy for being particularly helpful throughout the process.

"We in Somerville want to thank Governor Romney for his support and we want to particularly show our appreciation to Lt. Governor Healy, who has helped us on this and on a wide array of projects this year," Curtatone said. "We've also been pleased to work with Doug Foy on pursuing smart growth initiatives in Assembly Square, North Point, and now Union Square and the Brickbottom-InnerBelt area."

Source: Somerville Journal. Curtatone Hails State's Historic Green Line Decision, May 18, 2005.

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Green Line project may be postponed until 2014

BOSTON State and local leaders lashed out yesterday at the Executive Office of Transportation's proposal to postpone the completion of the Green Line extension to Somerville and Medford until 2014, and scrap the Red-Blue Line connector.

"The communities of Somerville, Cambridge and Medford have waited too long for the Green Line extension to become reality," said state Sen. Jarrett T. Barrios, D-Cambridge, who attended a hearing in downtown Boston yesterday called by the state Department of Environmental Protection.

The state Executive Office of Transporation (EOT), which is required by law to satisfy several commitments to offset the environmental impacts of the Central Artery Project, has submitted a revised list of commitments to the DEP for approval. The DEP held two public hearings yesterday for comment on the list and will make its decision after Jan. 17. The revisions include an extension of the Green Line project completion deadline to 2014 and if needed a further extension to 2017.

It also calls for scraping the Red-Blue Line connector (a rail link between the lines) and the restoration of the Arborway trolley service in Jamaica Plain. The state instead wants to improve service on the Fairmount commuter rail line and add 1,000 additional parking spaces at commuter rail stations.

Some believe these substitutions are not up to snuff.

"The Red-Blue Connector is essential to decongest the core of our transit system, and to meet the needs of East Boston and near North Shore communities," said Phil Warburg, president of the Conservation Law Foundation, which filed a federal lawsuit against the state demanding officials deliver on their original promises.

CHRISTINA WALLACE
cwallace@metro-boston.com

Source: Metro. Green Line Project may be postponed until 2014, December 22, 2005.